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Vol. 972 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 11, 1978

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 11, 1978 Volume 972 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

Notice of Expanded Classification Listing Service

Current information regarding the classification of patents, up to now available from the Patent and Trademark Office only in the form of subclass listings can now be obtained in two additional listing formats. The three types of listings are described as follows:

I. INDIVIDUAL SUBCLASS LISTING: a patent number sequence listing of all original and cross reference patents in a specified subclass.

NEW II. COMBINED SUBCLASS LISTING: a merged listing of all patents by number only, in numeric sequence, appearing in a group of specified subclasses.

NEW III. LISTING OF DISCRETE PATENTS IN COMBINED SUBCLASSES: a merged patent number sequence listing of the patents appearing in a group of specified subclasses showing their original and/or cross reference classifications.

Additionally, any of the above types of listings is also obtainable as a limited listing restricted by patent number range or year of issue (or by month of issue within the current year to facilitate your updating).

Type I listings are available at a cost of $1.00 for each 100 or fewer patent numbers. Listings of type II or III and limited listings of all types may be purchased at a cost of $2.00 for each 100 or fewer patent number or classification entries.

Requests for any of these types of listings should be made by completing a Classification Listing Order Form and sending it to the address shown on the form along with the required remittance.

Order forms are available in the Patent and Trademark Office Public Search Room, in patent depository libraries or by mail. Additional forms will be enclosed with each filed order.

Any questions regarding this service and requests for forms should be addressed to:

Patent Classification Listings
U.S. Patent and Trademark Office
Room 2C32, Crystal Plaza 3
Washington, D.C. 20231

Listings are normally processed and mailed out within 48 hours of receiving a request.

ALFRED C. MARMOR,
Administrator for Documentation.

May 30, 1978.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 213,431, Re. S.N. 906,364, Filed May 12, 1978, Cl. D8/144, KNOB, Leland George Stone, Owner of Record: *Amerock Corporation, Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

D. 218,877, Re. S.N. 906,362, Filed May 12, 1978, Cl. D8/158, PULL, LaVerne E. Clayton, Owner of Record: *Amerock Corp., Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

D. 220,934, Re. S.N. 906,361, Filed May 12, 1978, Cl. D8/166, HARDWARE FOR CABINETS OR THE LIKE, LaVerne E. Clayton, Owner of Record: *Amerock Corp., Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

D. 226,895, Re. S.N. 906,363, Filed May 12, 1978, Cl. D8/166, PULL, Raymond U. H. Tegner, Owner of Record: *Amerock Corporation, Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

D. 236,682, Re. S.N. 906,360, Filed May 12, 1978, Cl. D8/179, ESCUTCHEON, LaVerne E. Clayton, Owner of Record: *Amerock Corp., Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

3,956,298, Re. S.N. 904,640, Filed May 10, 1978, Cl. 260/248 NS, N-(3-HYDROXYARYL-PROPYL)-IMIDES, Hanns Lind, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 121

3,958,959, Re. S.N. 906,727, Filed May 17, 1978, Cl. 55/10, METHOD OF REMOVING PARTICLES AND FLUIDS FROM A GAS STREAM BY CHARGED DROPLETS, Ernest Cohen, et al., Owner of Record: *TRW Inc., Redondo Beach, Calif.,* Attorney or Agent: John J. Connors, et al., Ex. Gp.: 177

4,024,297, Re. S.N. 906,377, Filed May 16, 1978, Cl. 427/54, ACTINIC LIGHT POLYMERIZABLE COATING COMPOSITIONS, Gerald W. Gruber, Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: George D. Morris, Ex. Gp.: 162

4,027,433, Re. S.N. 905,116, Filed May 11, 1978, Cl. 51/410, SAND BLASTING APPARATUS, Wayne B. Hockett, Owner of Record: *Inventor,* Attorney or Agent: Stefan M. Stein, et al., Ex. Gp.: 323

4,036,187, Re. S.N. 904,753, Filed May 11, 1978, Cl. 123/32 SP, CLEAN SPARK IGNITION INTERNAL COMBUSTION ENGINE, Hui-Tzeng Ting, Owner of Record: *Inventor,* Attorney or Agent: Stuart S. Bowie, Ex. Gp.: 342

4,047,231, Re. S.N. 891,676, Filed Mar. 30, 1978, Cl. 360/36, HIGH STABILITY DIGITAL HEAD SERVO FOR VIDEO RECORDERS, Gary B. Garagnon, Owner of Record: *Ampex Corporation, Redwood City, Calif.,* Attorney or Agent: Robert G. Clay, Ex. Gp.: 235

PATENT NOTICES

Certificates of Correction for the Week of July 11, 1978

Re. 29,554	4,060,894	4,070,529	4,074,273
3,526,245	4,061,520	4,070,582	4,074,289
3,528,243	4,061,886	4,070,676	4,074,620
3,724,916	4,062,745	4,070,798	4,074,642
3,729,234	4,062,825	4,070,875	4,075,019
3,951,015	4,062,950	4,070,900	4,075,049
3,953,298	4,062,983	4,070,963	4,075,270
3,987,722	4,063,386	4,070,997	4,075,339
3,988,894	4,064,153	4,071,425	4,075,349
3,989,707	4,065,474	4,071,447	4,075,402
3,997,541	4,065,624	4,071,520	4,075,406
3,997,577	4,065,934	4,071,635	4,075,751
3,999,475	4,066,040	4,071,751	4,075,755
4,003,947	4,066,083	4,071,850	4,075,764
4,004,062	4,066,361	4,071,860	4,075,789
4,005,218	4,066,893	4,072,289	4,075,871
4,009,201	4,067,464	4,072,367	4,075,948
4,022,835	4,067,591	4,072,422	4,076,484
4,026,788	4,067,956	4,072,493	4,076,550
4,030,064	4,068,052	4,072,743	4,076,618
4,032,688	4,068,346	4,072,865	4,076,642
4,036,624	4,068,807	4,072,994	4,076,655
4,041,165	4,069,049	4,073,102	4,076,825
4,041,186	4,069,054	4,073,446	4,076,855
4,042,647	4,069,186	4,073,479	4,077,138
4,044,101	4,069,259	4,073,511	4,077,391
4,045,482	4,069,265	4,073,771	4,077,400
4,051,784	4,069,641	4,073,891	4,077,612
4,052,710	4,069,738	4,073,892	4,079,096
4,053,608	4,069,879	4,073,916	4,079,287
4,055,727	4,070,007	4,073,967	4,079,407
4,055,995	4,070,113	4,073,986	4,080,119
4,056,250	4,070,133	4,074,120	4,088,621
4,056,524	4,070,273	4,074,126	4,091,588
4,056,556	4,070,404	4,074,210	
4,060,043	4,070,406	4,074,212	

Dedication

3,650,460.—*Burke P. Lokey*, Covington, Va. PAPER BAG. Patent dated Mar. 21, 1972. Dedication filed May 8, 1978, by the assignee, *St. Regis Paper Company*.

Hereby dedicates the balance of the term of said patent to the Citizens of the United States of America.

Disclaimers

3,808,765.—*James Ludwig Wahlers*, Littleton, Colo., *Rupert Douglas Terry*, Toledo, Ohio, *William Scott, Jr.*, Littleton, Colo., and *Charles Donald Simmers*, Bowling Green, Ohio. INVERTING AND REVERSING CONVEYOR. Patent dated May 7, 1974. Disclaimer filed May 30, 1978, by the assignee, *Johns-Manville Corporation*.

Hereby enters this disclaimer to claims 1, 2, 6 and 7 of said patent.

3,829,327.—*Thomas T. Omori*, Glendale, and *Hiroshi Imaoka*, Gardena, Calif. CARBON PAPER. Patent dated Aug. 13, 1974. Disclaimer filed Mar. 27, 1978, by the assignee, *Kreha Corporation of America*.

Hereby enters this disclaimer to claims 1 through 12, inclusive of said patent.

3,851,770.—*Cecil Jenkins* and *Joseph R. Wollslayer*, Tulsa, Okla. PIVOTED WELL DRILLING MAST AND SEPARATE TOWER. Patent dated Dec. 3, 1974. Disclaimer filed Jan. 16, 1978, by the assignee, *Lee C. Moore Corporation*.

Hereby enters this disclaimed to claims 1, 3, 4, 5, 6 and 7 of said patent.

3,941,307.—*Edmund G. Van Malderghem*, Lewiston, N.Y. ENVELOPE ASSEMBLY. Patent dated Mar. 2, 1976. Disclaimer filed May 23, 1978, by the assignee, *Moore Business Forms, Inc.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

Patents Available for Licensing or Sale

3,680,237. OUT-DOOR ILLUMINATED SIGN. John G. Finnerty, 251 De Grand Ave., Teaneck, N.J. 07666.

3,851,821. RAIL JOINT. Jose Juncosa Lopez, Paseo de la Habana 80, Madrid 16, Spain. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,044,476. EDUCATIONAL METHODS AND DEVICES. Jeanette B. Marsh, 1400 North Lake Shore Drive, 14–M, Chicago, Ill. 60610.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif. 91793.

4,064,999. ADJUSTABLE BUILDING PANEL SCAFFOLD. Simon Young, P.O. Box 41, Mamou, La. 70554.

4,065,640. APPARATUS FOR INTERCONNECTING A TELEPHONE LINE AND A PORTABLE CALCULATOR. Jeane Marie Rouiller, Couvet, Switzerland. Correspondence to: Stevens, Davis, Miller & Mosher, P.O. Box 2627, Arlington, Va. 22202.

4,066,650. KETO-ALDEHYDE-AMINE ADDITION PRODUCTS AND METHOD OF MAKING SAME. Laszlo G. Egyud, 21 Redgate Lane, Quissett, Falmouth, Mass. 02543. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

The following two patents are offered by John O. Richards, 980 Mill Circle, Apt. #99, Alliance, Ohio 44601.

3,835,507. ROPE HOLDING DEVICE.

3,578,840. REVOLVING REFLECTOR.

The American Dental Association Health Foundation is prepared to grant licenses under the following patents upon reasonable terms:

4,018,600. METHOD FOR ELIMINATING GAMMA$_2$ FROM DENTAL AMALGAM AND IMPROVED DENTAL AMALGAM COMPOSITION.

4,078,921. METHOD FOR ELIMINATING GAMMA$_2$ FROM DENTAL AMALGAM AND IMPROVED DENTAL AMALGAM COMPOSITION.

3,892,579. ADHESIVE REFRACTORY PROTECTIVE COMPOSITION FOR INVESTMENT CASTING.

The RCA Corporation offers to grant non exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

4,081,896. METHOD OF MAKING A SUBSTRATE CONTACT FOR AN INTEGRATED CIRCUIT.

4,082,425. OPTICAL COUPLER.

4,082,438. ZERO-ORDER DIFFRACTIVE SUBTRACTIVE FILTER PROJECTOR.

4,082,453. FABRICATION OF RECTANGULAR RELIEF PROFILES IN PHOTORESIST.

4,082,865. METHOD FOR CHEMICAL VAPOR DEPOSITION.

4,082,996. VIDEO AMPLIFIER INCLUDING AN A-C COUPLED VOLTAGE FOLLOWER OUTPUT STAGE.

4,083,051. CIRCULARLY-POLARIZED ANTENNA SYSTEM USING TILTED DIPOLES.

4,083,710. METHOD OF FORMING A METAL PATTERN ON AN INSULATING SUBSTRATE.

4,084,070. OVERCURRENT PROTECTION CIRCUIT.

4,084,071. SWITCH MECHANISM FOR A CALCULATOR TYPE KEYBOARD.

4,084,115. CIRCUIT FOR CORRECTING SETUP ERROR IN A COLOR TELEVISION RECEIVER.

4,084,127. DIGITAL FREQUENCY DEVIATION DETECTOR USEFUL IN A TELEVISION TUNING SYSTEM.

4,084,156. VOLTAGE MONITORING CIRCUIT.

4,084,177. SECAM SUBCARRIER GENERATOR.

4,084,188. OPTICAL FILTER.

4,084,672. AUTOMATIC CONTROL OF FREE WHEELING.

4,084,690. VIDEO DISC PACKAGE HAVING A CENTER POST.

4,084,691. VIDEO DISC PACKAGE.

4,084,772. ROLL/YAW BODY STEERING FOR MOMENTUM BIASED SPACECRAFT.

4,084,773. MAGNETIC CONTROL OF SPACECRAFT ROLL DISTURBANCE TORQUES.

4,084,970. ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIA USING SUCROSE BENZOATE.

4,085,178. METHOD FOR PRODUCING INJECTION MOLDED AND CENTRALLY APERTURED DISC RECORDS.

4,085,359. SELF-STARTING AMPLIFIER CIRCUIT.

4,085,367. METHOD AND DETECTION OF PHASE AND FREQUENCY MODULATION.

4,085,377. MICROWAVE FREQUENCY DISCRIMINATOR COMPRISING A ONE PORT ACTIVE DEVICE.

4,085,432. VOLTAGE LIMITER CIRCUIT.

4,086,501. PLANAR TRANSFERRED ELECTRON LOGIC DEVICE WITH IMPROVED BIASING MEANS.

4,086,513. PLURAL GUN CATHODE RAY TUBE HAVING PARALLEL PLATES ADJACENT GRID APERTURES.

4,086,579. VIDEO DIGITAL DISPLAY DEVICE WITH ANALOG INPUT.

4,086,617. VIDEO DISC PLAYER MECHANISM CONTROL SYSTEM.

The following 12 patents are offered by Dr. Richard A. Wallace, 7304 SW. 53rd Ave., Portland, Oreg. 97219.

3,712,025. CONTINUOUS ELECTROMIGRATION PROCESS FOR REMOVAL OF GASEOUS CONTAMINANTS FROM THE ATMOSPHERE AND APPARATUS.

3,718,559. ELECTROGEL PROCESS FOR REMOVING ELECTROLYTES AND CONCENTRATING THE SAME FROM AN AQUEOUS SOLUTION.

3,727,375. APPARATUS FOR THE CONTINUOUS ELECTROMIGRATION PROCESS FOR REMOVAL OF GASEOUS CONTAMINANTS FROM THE ATMOSPHERE.

3,773,043. CHEMICAL BREATHING APPARATUS WITH ALARM DEVICE.

3,799,810. FAST ACTIVATION RESERVE BATTERY.

3,846,366. STRUCTURAL MATERIAL AND METHOD.

3,847,788. ELECTROGEL APPARATUS FOR REMOVING ELECTROLYTES AND CONCENTRATING THE SAME FROM AN AQUEOUS SOLUTION.

3,902,485. CHEMICALLY ACTIVATED WARNING SYSTEM.

3,911,413. THERMALLY ACTIVATED WARNING SYSTEM.

3,911,005. STRUCTURAL MATERIAL AND METHOD.

4,013,616. MIXED POLYMERIC STRUCTURAL MATERIAL AND METHOD.

4,008,077. REJUVENATION OF WASTE SILVER-LADEN SOLUTIONS.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half Street SW., Washington, D.C. 20324

Patent application 850,325. Thinned Withdrawal Weighted Surface Acoustic Wave Interdigital Transducers. Filed Nov. 10, 1977.

Patent application 864,065. Junction-Storage JFET Bucket-Brigade Structure. Filed Dec. 23, 1977.

Patent application 864,067. Nondestructive Testor for Fiberglass-Aluminum Honeycomb Structures. Filed Dec. 23, 1977.

Patent application 865,269. Precision Antenna Alignment Procedure. Filed Dec. 28, 1977.

Patent application 866,125. Simplified Plug-In Filter. Filed Dec. 30, 1977.

Patent application 866,186. Communication System Beamport Sidelobe Canceller. Filed Dec. 30, 1977.

Patent 4,070,655. Virtually Nonvolatile Static Random Access Memory Device. Filed Nov. 5, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,709. Piecewise Linear Predictive Coding System. Filed Oct. 13, 1976, patented Jan. 24, 1978. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782.

Patent application 775,228. Control of Nematodes and Other Helminths. Filed Mar. 7, 1977.

Patent application 873,570. Process for Preparing Mixed Bean Salads. Filed Jan. 30, 1978.

Patent application 873,573. Mini-Injector. Filed Jan. 30, 1978.

Patent application 875,049. Attractant for Male Mediterranean Fruit Fly. Filed Feb. 3, 1978.

Patent 4,066,792. Method of Producing Soybean Milk Yoghurt. Filed Sept. 22, 1976. Patented Jan. 3, 1978. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014.

Patent application 828,926. The Compound, 4-Carboxyphthalato (1,2 Diaminocyclohexane) Platinum (II) and Alkali Metal Salts Thereof and Its Use in Alleviating L1210 Murine Leukemia. Filed Aug. 29, 1977.

Patent application 847,022. Parabolic Focussing Thermal Detector for Low Level Ultrasonic Power Measurements. Filed Oct. 31, 1977.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 833,216. Safing a Flueric Cartridge Initiator. Filed Sept. 14, 1977.

Patent application 843,760. Solar Energy Window. Filed Oct. 20, 1977.

Patent Application 852,119. Underwater Self-Gripping Pile Cutting Device. Filed Nov. 16, 1977.

Patent Application 852,126. Photographic Image Enhancement by Photofission. Filed Nov. 16, 1977.

Patent application 853,157. Fiber Optic Delay Line Filter. Filed Nov. 21, 1977.

Patent application 853,777. Thoroidal Polisher. Filed Nov. 21, 1977.

Patent application 859,637. Single Filament Fiber Optic Cable Parting Tool. Filed Dec. 12, 1977.

Patent Application 863,840. Cryogenic Refrigeration System. Filed Dec. 23, 1977.

Patent application 864,417. Growth Techniques for Preparing Graded Gap Semiconductors and Devices. Filed Nov. 24, 1976.

Patent application 867,619. Radioiodine Detector Based on Laser Induced Fluorescence. Filed Jan. 6, 1978.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

Patent application 858,596. Over-under Double-Pass Interferometer. Filed Dec. 8, 1977.

Patent application 858,767. Clutter Free Synthetic Aperture Radar Correlator. Filed Dec. 8, 1977.

Patent application 863,773. Method of Construction of a Multi-Cell Solar Array. Filed Dec. 23, 1977.

Patent application 878,542. Microwave Dichroic Plate. Filed Feb. 16, 1978.

Patent 3,359,568. Helmet Feedport. Filed Mar. 30, 1966. Patented Dec. 26, 1967. Not available NTIS.

Patent 3,487,765. Protective Garment Ventilation System. Filed Oct. 6, 1966. Patented Jan. 6, 1970. Not available NTIS.

Patent 3,488,771. Helmet Latching and Attaching Ring. Filed Mar. 17, 1966, patented Jan. 13, 1970. Not available NTIS.

Patent 3,490,074. Restraining Mechanism. Filed Oct. 6, 1966. Patented Jan. 20, 1970. Not available NTIS.

Patent 3,908,118. Cross Correlation Anomaly Detection System. Filed Feb. 27, 1973, patented Sept. 23, 1975. Not available NTIS.

Patent 3,909,602. Automatic Visual Inspection System for Microelectronics. Filed Sept. 27, 1973, patented Sept. 30, 1975. Not available NTIS.

Patent 4,053,231. Interferometer Mirror Tilt Correcting System. Filed Dec. 18, 1975, patented Oct. 11, 1977. Not available NTIS.

Patent 4,055,041. Integrated Gas Turbine Engine—Nacelle. Filed Nov. 3, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,089. Semiconductor Projectile Impact Detector. Filed Mar. 11, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,147. Automatic Fluid Dispenser. Filed Oct. 8, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,777. Window Comparator. Filed Nov. 2, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,810. Independent Gain and Bandwidth Control of a Traveling Wave Maser. Filed July 26, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,065,053. Low Cost Solar Energy Collection System. Filed July 24, 1975, patented Dec. 27, 1977. Not available NTIS.

Patent 4,068,763. Wrist Joint Assembly. Filed July 26, 1976, patented Jan. 17, 1978. Not available NTIS.

Patent 4,069,661. Variable Mixer Propulsion Cycle. Filed June 2, 1975, patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,574. Magnifying Image Intensifier. Filed Apr. 28, 1976. Patented Jan. 24, 1978. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 20, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-22-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Sterolds; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-11-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-1-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-5-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-17-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-3-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-26-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-10-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors: Reaction Motors: Pumps; Rotary Engines and Pumps: Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission: Fluid Handling and Control; Lubrication.	5-3-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during May 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,981,954 to 2,986,736, inclusive
Plant Patents..... Numbers 2,055 to 2,066, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,694

TOOL SUPPORT FOR USE IN MACHINE TOOLS PARTICULARLY IN TURNING MACHINES

Gerhard Foll, Esslingen, and Heinrich Lahm, Esslingen-Sirnau, both of Germany, assignors to Index-Werke KG Hahn & Tessky, Stuttgart, Germany

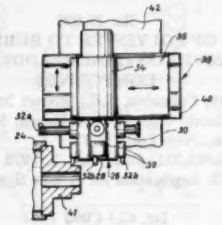
Original No. 3,846,880, dated Nov. 12, 1974, Ser. No. 411,381, Oct. 31, 1973. Division of Ser. No. 79,483, Oct. 9, 1970, Pat. No. 3,786,539. Application for reissue Nov. 3, 1976, Ser. No. 738,346

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1969, 1952050

Int. Cl.[2] B23B *7/04, 3/18*

U.S. Cl. 29—36

18 Claims



4. [A combination as defined in claim 3, and] *In a machine tool, a combination comprising a frame; a work spindle for carrying a workpiece to be machined, said work spindle being mounted on said frame rotatable about a first axis; a slide including a first carriage reciprocably mounted on said frame and a second carriage mounted on said first carriage, one of said carriages being reciprocable substantially axially and the other substantially radially of said work spindle; and tool support means mounted on said second carriage and comprising a turret indexible with respect to the second carriage only about a second axis located in a plane including said first axis, said turret being provided with at least two rows of receiving means for tool holders, said receiving means being arranged in at least two groups disposed in two parallel planes spaced in the direction of said second axis from each other, said rows being arranged about said second axis coaxial therewith, said coaxial rows of receiving means being spaced from each other in the direction of movement of one of said carriages said combination also* including a plurality of tool holders respectively mounted on said receiving means and a tool in each of said tool holders, the tools in the tool holders of one of said groups of receiving means extending substantially in the direction of said second axis and being adapted to remove material from the exterior of a workpiece carried by said work spindle and the tools in the tool holders of the other of said groups extending in a direction substantially normal to said second axis and being adapted to remove material from the interior of the workpiece.

9. In a machine tool for use with a plurality of removable tools wherein a selected one of said tools is located at a work position and is capable of being moved into working engagement with a rotating workpiece, a combination comprising: a frame; a work spindle mounted on said frame for carrying the workpiece and means rotating the spindle and the workpiece about a first axis; a slide including a first carriage reciprocably mounted on said frame and a second carriage reciprocably mounted on said first carriage, means reciprocating one carriage substantially axially of said first axis and means reciprocating the other carriage along a transverse axis generally parallel to a radial of said first axis; mounting means on said second carriage; a turret extending from said mounting means and indexible relative thereto about a second axis to a plurality of fixed positions each representing a work position for a tool; said turret having a first annulus portion spaced from said mounting means, concentric with said second axis and defining a plurality of circumferentially spaced receiving means in said first annulus portion for a predetermined number of first removable tools and a second annulus portion between said mounting means and said first annulus portion, concentric with the latter and defining a plurality of circumferentially spaced receiving means in said second annulus portion for a predetermined number of second removable tools; said carriages being respectively movable along said first axis and along said transverse axis and selectively positioning a predetermined receiving means of one annulus portion to where a tool received therein is in working engagement with the workpiece, said turret being movable in the direction defined by the spacing between said annulus portions to selectively position either annulus portion to where a predetermined receiving means thereof is in a tool working engagement position, said first and second annulus portions being spaced apart to permit the mounting of tools in all receiving means, any selected receiving means of either annulus portion when in said tool working engagement position being spaced closer to said first axis than all receiving means of the other annulus portion and the tools thereof.

Re. 29,695

OUTBOARD MOTOR WITH SPEED REGULATOR FOR DC PERMANENT MAGNET MOTOR

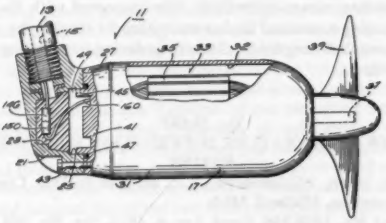
Charles H. Blake, Sault Sainte Marie, Canada, assignor to Outboard Marine Corporation, Waukegan, Ill.

Original No. 3,954,081, dated May 4, 1976, Ser. No. 549,951, Feb. 14, 1975. Continuation-in-part of Ser. No. 399,609, Sep. 21, 1973, abandoned. Application for reissue Aug. 11, 1976, Ser. No. 713,391

Int. Cl.[2] B63H *21/26*

U.S. Cl. 115—18 E

31 Claims



23. An outboard motor comprising a shaft extending vertically under normal operating conditions and adapted to be connected to a boat hull, said shaft including a hollow interior, a lower housing fixedly connected to said shaft and including a hollow interior communicating with said hollow interior of said shaft, an electric motor mounted in said housing hollow interior and including an output shaft including a first end extending exteriorly of said lower housing and a second end terminating within said hollow interior of said lower housing, a propeller mounted on said first end of said output shaft, a control circuit for said motor including a heat generating electrical component electrically connected to said motor and located in said housing hollow interior in axially spaced relation from said output shaft, and a thermally conductive means fixedly bonding said heat generating electrical component to said housing.

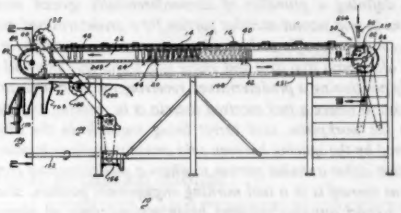
Re. 29,696
APPARATUS IMPROVEMENTS IN TEMPERATURE-CONDITIONING PARTS

Charles L. D. Chin, Avon; Joseph R. Reilly, Naugatuck, both of Conn.; L. John Berggren, deceased, late of Simsbury, Conn., by Edith O. Berggren, executrix, Olathe, Kans., assignors to Monsanto Company, St. Louis, Mo.

Original No. 3,894,835, dated Jul. 15, 1975, Ser. No. 418,075, Nov. 21, 1973. Application for reissue Mar. 25, 1977, Ser. No. 781,262

Int. Cl.[2] F27B *9/14*

U.S. Cl. 432—124 **36 Claims**



1. Apparatus for temperature-conditioning elongated molded parts which comprises:

a. wall sections defining a horizontally extending chamber;

b. heat transfer assemblies *within and extending along at least about two thirds of the length of said chamber to form a heat transfer zone therein, said heat transfer assemblies being* spaced from each other [and extending along said chamber defining] *in the horizontal direction to define* generally parallel paths for said parts, *the height of said heat transfer assemblies in a direction substantially perpendicular to their lengthwise dimensions being adequate to oppose a substantial portion of the length of said elongated parts when positioned in such paths;*

c. a plurality of bar assemblies *above said heat transfer assemblies* having means to hold said parts in said paths *in suspended position* with their lengthwise dimensions substantially normal to the *lengthwise* direction of extension of said heat transfer assemblies;

d. means for advancing said bar assemblies through said chamber; and

e. rotating means operatively interconnected with the advancing means and the bar assemblies for turning the parts about their lengthwise dimensions during travel along said paths.

Re. 29,697
LOW TEMPERATURE SOLVENTLESS SILICONE RESINS

Alan E. Mink, Williamstown, N.J., assignor to Dow Corning Corporation, Midland, Mich.

Original No. 3,948,848, dated Apr. 6, 1976, Ser. No. 601,781, Aug. 4, 1975. Application for reissue Feb. 28, 1977, Ser. No. 772,720

Int. Cl.[2] C08L *83/04*

U.S. Cl. 260—37 SB **10 Claims**

1. A curable composition consisting essentially of a mixture of

A. a copolymer of (in mole percent) 35 to 42 monophenylsiloxane, 0 to 12 diphenylsiloxane, 35 to 50 dimethylsiloxane and 8 to 15 vinylmethylsiloxane, and

B. a copolymer of (in mole percent) 8 to 15 diphenylsiloxane, 30 to 55 methylhydrogensiloxane, 28 to 45 dimethylsiloxane and 5 to 12 trimethylsiloxane in amount such that there is a stoichiometric amount of SiH and Si vinyl ±10 percent of either ingredient.

3. A curable composition consisting essentially of, in percent by weight, 35 to 65 of (A) plus (B) of claim 1, 5 to 25 of glass fibers having an average length of from 1/32 to ¼ inch and 10 to 50 of crystalline silica having an average particle size of 2 to 8 microns.

Re. 29,698
STABILIZATION OF AHF USING HEPARIN

Lajos F. Fekete, Costa Mesa, and Stephen L. Holst, Santa Ana, both of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Original No. 3,803,115, dated Apr. 9, 1974, Ser. No. 254,148, May 17, 1972. Application for reissue Apr. 6, 1976, Ser. No. 674,270

Int. Cl.[2] C07G *7/00*

U.S. Cl. 260—112 B **21 Claims**

1. The method of improving the yield of AHF obtained from blood plasma and plasma fractions comprising admixing from about 0.01 to about ten units of heparin to a concentrate of AHF obtained from said plasma or plasma fraction by cyroprecipitate per ml. of solution of said concentrate of AHF.

Re. 29,699
ADHESION OF POLYESTER TO RUBBER USING AN ADHESIVE CONTAINING ADDED METAL COMPOUNDS

Robert J. Kelly, Columbia, S.C.; Robert Miller, Woodbridge, Conn., and David Adams, Port Huron, Mich., assignors to Uniroyal, Inc., New York, N.Y.

Original No. 3,903,332, dated Sep. 2, 1975, Ser. No. 332,833, Feb. 15, 1973. Application for reissue Sep. 1, 1977, Ser. No. 830,000

Int. Cl.[2] C09J *7/04*

U.S. Cl. 428—414 **33 Claims**

1. In a shaped polyester article bearing from 2 to about 30% by weight of an adhesive coating composition comprising the reaction products of:

a first component (I) comprising

I. A. a polyepoxide having an average of at least two epoxy groups in each molecule, a melting point below about 150° C., an average molecular weight below about 3,000 and an epoxide equivalent below about 2,500 and

B. an aromatic polyisocyanate from the class consisting of $Ar(NCO)_n$ $[Ar(NCO)_n]_m$, and $Ar(NHCOX)_n$; wherein Ar is an organic residue containing at least one aromatic nucleus, X is a radical, selected from the group consisting of aryloxy, arylthio, iminoxy and lactam-N-yl, and m and n are whole numbers of at least 2; the weight ratio of (A)/(B) being within the range of from about 0.01 to about 5.0 and the % by weight being 0.2 to 5.0; in combination, with

II. [the residue amounting to] *a second component (II), of from about* 1.8 to 25% by weight of a [rubber latex containing the reaction product of a phenol] *mixture of the dried reaction products of a phenoliformaldehyde resin, a rubber latex* and formaldehyde, said rubber latex being selected from the group consisting of natural rubber, SBR and butadiene-vinylpyridine-styrene rubber;

the improvement comprising having added to said [coating composition] *first component I while in admixture with a liquid carrier and* prior to deposit on said polyester article, *a* sufficient amount of a metal-containing compound in the range between 0.00001 and 0.010 moles per 1,000 grams of said [coating composition] *first component I in its liquid carrier* to result in an adhesive bond which has at least a 5% improvement in appearance rating using the hot strip adhesion test, said improvement being compared with a rubber-polyester article control that contains no metal containing compound in said adhesive coating composition, said metal being selected from the group consisting of sodium, potassium rubidium, cesium, strontium, silver, cadmium, barium, cerium, uranium, titanium, vanadium,

chromium, tin, antimony, maganese, iron, cobalt, nickel, copper, zinc, lead, bismuth, calcium and zirconium whereby less adhesive is required to achieve the same degree of adhesion as when an adhesive containing no metal-containing compound is used.

Re. 29,700
VOLTAGE-CURRENT CONVERTER

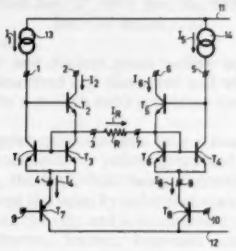
Rudy Johan van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Original No. 4,004,247, dated Jan. 18, 1977, Ser. No. 586,051, Jun. 11, 1975. Application for reissue Jun. 8, 1977, Ser. No. 804,548

Claims priority, application Netherlands, Jun. 14, 1974, 7407953; Mar. 27, 1975, 7503664

Int. Cl.² H03F *3/45*

U.S. Cl. 330—257 **8 Claims**



1. A voltage-current converter with a balanced-voltage input and a balanced-current output, comprising:

a first current mirror circuit comprising first and second transistors, each having an emitter, base and collector, and a first semiconductor junction having an anode and cathode, said first and second transistors and said first semiconductor junction all being of a first conductivity type, said cathode of said first semiconductor junction being connected to said emitter of said first transistor, said collector of said first transistor being connected to said base of said second transistor, and said base of said first transistor being connected to said anode of said first semiconductor junction and said emitter of said second transistor;

a second current mirror circuit comprising the same elements as said first current mirror circuit;

a first current source circuit connected to said collector of said first transistor of said first current mirror circuit;

a second current source circuit connected to said collector of said first transistor of said second current mirror circuit;

a first impedance connected between said emitter of said second transistor of said first current mirror circuit and said emitter of said second transistor of said second current mirror circuit; and

third and fourth transistors each having an emitter, base and collector, said emitter of said third transistor being connected to said emitter of said first transistor of said first current mirror circuit said emitter of said fourth transistor being connected to said emitter of said first transistor of said second current mirror;

the balanced-voltage input being between said bases of said third and fourth transistors, and the balanced-current output being between said collector of said second transistor of said first current mirror circuit and said collector of said second transistor of said second current mirror circuit.

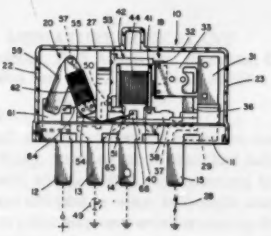
Re. 29,701
TIMED BUZZER

Arthur J. Little, Springfield, and William R. Mayer, Rochester, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Original No. 4,003,043, dated Jan. 11, 1977, Ser. No. 652,592, Jan. 26, 1976. Application for reissue Apr. 11, 1977, Ser. No. 786,680

Int. Cl.² G01K *1/08*; G08B *3/00*

U.S. Cl. 340—403 **11 Claims**



1. A timed buzzer, comprising; housing means, a coil assembly mounted in said housing means, an armature supporting member, a flexible armature connected to said armature supporting member, a contact carried by said armature, a contact member supported in said housing means and being positioned to be engageable with said armature contact, said armature being positioned so that the coil, when energized, will move the armature contact out of engagement with the contact member, first terminal means connected to said armature, said contact member being connected to one end of said coil assembly, second terminal means, said second terminal means being connected to the other end of the coil assembly, said armature having sound producing means thereon, a timer assembly mounted in said housing means, said timer assembly including first and second bimetal elements, third terminal means, [one of said elements] *said first bimetal element* being connected to said third terminal means, one of said bimetal elements having heater means thereon, [another of said elements] *said second bimetal element* being connected to said second terminal means, to provide a circuit to energize said coil assembly when said third terminal means is positive, fourth terminal means for grounding, said heater means being connected to both said third terminal means and said fourth terminal means so that the heater means heats the bimetal elements whenever said third terminal means is positive opening said bimetal elements after a predetermined time delay terminating operation of the sound producing means.

PLANT PATENTS

GRANTED JULY 11, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,276
PIPERACEAE PLANT FAMILY

Barnell L. Cobia, Winter Garden, and Stephen H. Griffith, Apopka, both of Fla., assignors to B. L. Cobia, Inc., Winter Garden, Fla.

Filed Jun. 27, 1977, Ser. No. 810,650
Int. Cl.[2] A01H *5/12*
U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct plant variety of the Piperaceae Family as is described and illustrated and which is primarily distinguished by a growth habit providing specimens with leaf blades that

(1) at the upper epidermal side have a basic field which in color is dominated by yellow green and/or greenish yellow hues, the basic field being discontinuous and interrupted along the veins by color that varies in lateral penetration from the vein and is dominated by reddish orange, reddish brown, brown, brownish orange, yellowish brown and/or orange yellow hues, and the basic field being commonly endowed with elongated streaks of color weaknesses that appear between the primary veins as overtones of light greenish gray, greenish white and/or yellowish grey colors and

(2) at the lower epidermal side have a basic field which in color is dominated by a yellow green hue and which is discontinuous and interrupted along the veins by color that varies in lateral penetration from the vein and is dominated by pink and/or red hues.

4,277
ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Sep. 2, 1977, Ser. No. 830,353
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by buds and flowers which are medium to deep rose pink in color, (often deeper colored outdoors), the buds and flowers resembling Judy Fischer (miniature — U.S. Plant Pat. No. 3,137) in size and shape; and further characterized by a plant which is vigorous and compact, easy to propagate from cuttings or by budding, with an abundance of disease resistant small semi-glossy or matt foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

4,278
MINIATURE ROSE PLANT

Edward P. Woolcock, 1015 Acacia Dr., Placentia, Calif. 92670

Filed Sep. 2, 1977, Ser. No. 830,354
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded much branched habit, substantially as illustrated and described, characterized by buds and flowers which are soft pink in color, with slight coral tone, the depth or shade of color may vary as influenced by the temperature and light intensity, the buds and flowers resembling Judy Fischer (miniature — U.S. Plant Pat. No. 3,137) in size and shape; and further characterized by a plant which is vigorous and compact, easy to propagate from cuttings, with an abundance of small to medium size matt foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

4,279
DUTCH IRIS PLANT NAMED APOLLO

Gerard Dirk Hommes, Heiloo (N.H.), Netherlands, assignor to Marlboro Bulb Farms, Wilmington, N.C.

Filed Sep. 23, 1977, Ser. No. 836,236
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of iris plant substantially as herein shown and described, characterized by the distinctive colored falls having an orange-yellow blotch and light yellow body and by its white standards, by its very large flower, by its tight buds allowing for long distance shipping before the bud opens, by its fast early growing habit, its strong large upright stems, with little or no crinkling of the falls and upright standards, and by its minimum size bulbs and its capability of blooming at any specific time in controlled environment.

PATENTS

PLANT PATENTS

GRANTED JULY 11, 1978

PATENTS

GRANTED JUL. 11, 1978

ERRATA

For CLASS	See PATENT NO.
029–579	4,099,305
108–114	4,099,472
400–004	4,099,606
220–403	4,099,665
315–127	4,099,807
029–157.3 D	4,099,928
062–073	4,099,946
062–532	4,099,947
106–039.7	4,100,001
424–078	4,100,027
528–116	4,100,111
521–038	4,100,113
521–175	4,100,114
521–083	4,100,115
521–167	4,100,116
528–010	4,100,134
528–011	4,100,135
528–011	4,100,136
526–021	4,100,137
526–262	4,100,138
528–196	4,100,139
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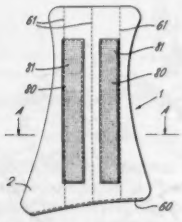
528–312	4,100,145
528–313	4,100,146
528–362	4,100,147
528–374	4,100,148
544–225	4,100,158
544–277	4,100,159
424–274	4,100,160
424–274	4,100,161
424–325	4,100,170
568–730	4,100,202
568–730	4,100,203
568–730	4,100,204
568–730	4,100,205
568–730	4,100,206
568–804	4,100,207
568–902	4,100,208
568–918	4,100,209
423–345	4,100,233
425–533	4,100,307
427–130	4,100,326
315–297	4,100,476

PATENTS

GRANTED JULY 11, 1978

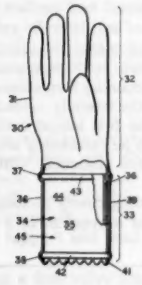
GENERAL AND MECHANICAL

4,099,269
PROTECTIVE DEVICE
Miroslav Joseph Porner, 24 Bracken Ave., Epsom, Auckland, New Zealand
Filed Jan. 28, 1977, Ser. No. 763,510
Claims priority, application New Zealand, Feb. 4, 1976, 179918
Int. Cl.[2] A41D *13/08*; B68C *5/00*
U.S. Cl. 2—16 **7 Claims**



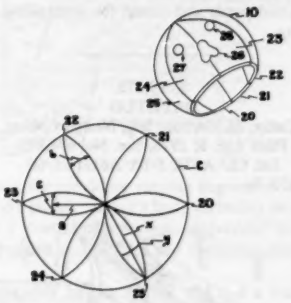
1. A protective device including a plurality of layers of substantially resilient and shock absorbent material; the layers of substantially resilient and shock absorbent material being provided in juxtaposition one with the other and within an outer covering; the substantially resilient and shock absorbent material being sheet material formed or provided with a plurality of integral, open faced pockets therein; a backing sheet being provided with each layer of substantially resilient and shock absorbent material so as to enclose the pockets and the arrangement being such that the substantially resilient and shock absorbent material within said outer covering, provides a protective cushioning when a blow or force is applied thereto.

4,099,270
SLIP-ON RUBBER GLOVES
Richard J. Jabour, 102 Butman Rd., Lowell, Mass. 01852
Filed Feb. 16, 1977, Ser. No. 769,119
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—168 **5 Claims**



1. In combination
an elongated, flexible, resilient limp rubber glove having a fingered hand portion of predetermined length and an integral cuff portion of about half said length;
a hollow, elongated support of thin, self-supporting, flexible sheet material sleeved within the said cuff portion of said glove and substantially coextensive in length with said cuff portion;
said support having opposite fully open, normally circular ends and normally supporting said cuff portion in full open configuration for the easy reception of the hand of the wearer in donning the glove;
and said support having an integral, outwardly projecting bead of enlarged diameter at each opposite end thereof, each bead extending circumferentially around said support to increase the friction and tension of the cuff portion of said glove sleeved therearound and to avoid sharp peripheral edges on said support.

4,099,271
LIGHTWEIGHT COSTUME HEAD
Terry Mark Allen, 2526 Commonwealth, Salt Lake City, Utah 84109, and William Duane Derfler, 10536 Whitesands, Sandy, Utah 84070
Filed May 8, 1975, Ser. No. 575,496
Int. Cl.[2] A42C *1/00*
U.S. Cl. 2—192 **2 Claims**

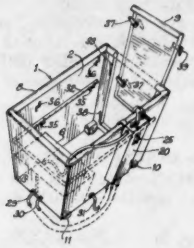


1. A method of forming a substantially spherical hollow shape from a flat elastomeric foam slab comprising:
(a) sculpturing a small scale model of the head shape desired;
(b) completely covering said sculptured model with latex and allowing same to dry;
(c) removing said latex shell from said model;
(d) cutting said latex shell into a number of sections and placing darts in same so that said latex sections become flat patterns;
(e) magnifying and transferring the latex pattern onto thin flat foam material;
(f) cutting the foam material into the desired patterns and joining the pattern sections together to form a costume head of substantially the same shape as the sculptured model.

4,099,272
BATHING APPARATUS FOR INVALIDS
Gene F. Sowder, 1009 Ogden St., Denver, Colo. 80218
Filed Jun. 16, 1977, Ser. No. 806,986
Int. Cl.[2] A47K *3/22*
U.S. Cl. 4—148 **1 Claim**

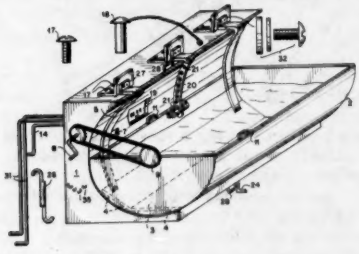
1. A device for bathing invalid and elderly persons which comprises:
- a mobile bathtub mounted on casters having a gate-like opening in one of its walls;
- a door within said opening;
- watertight means for securing the door within said opening;
- at least one liquid supply tank;
- a outlet at the bottom of said tank;

- at least one liquid spraying means;
- a drainage outlet at the bottom of the tub;
- at least one valve for selectively connecting said spray means to one or more of said outlets;
- conduit means between said spray means and said valve and between said valve and said outlets;



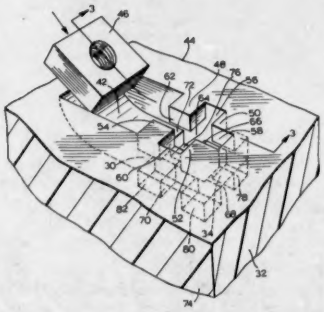
- a pump for forcing liquid from said outlets through the conduits toward said valve; and
- a movable console suspendable over the rim of the bathtub housing said pump and means for controlling said valve and pump.

4,099,273
BATHTUB
Wenham J. Colby, 35 Hertzler Rd., Newport News, Va. 23602
Filed Apr. 8, 1976, Ser. No. 674,975
Int. Cl.[2] A47K *3/06*; A61H *33/00*
U.S. Cl. 4—173 R **2 Claims**



1. A bathtub assembly which comprises the combination of:
(a) a rigid, polyhedral support structure having a top, bottom, front, back, and 2 side faces, the support structure having a channel, the configuration of which is substantially a half circular cylinder, the channel partially penetrating into the support structure from the intersection of the top and front faces thereof and extending along the length thereof from one side face to the other side face thereof;
(b) a concave, watertight body substantially having the configuration of a half circular cylinder, the body positioned within the channel so that the cylindrical surface of the body conforms to the cylindrical configuration of the channel, the cylindrical surface of the body being mounted on the support structure so that the body may rotate about the longitudinal axis thereof;
(c) releasable locking means for temporarily securing the body in (1) a first position defined by complete congruence of the body and the channel, or (2) a second position defined by parallelism of the plane of the bottom of the support structure with the plane joining the remanent diameters of the half circular cylindrical body;
(d) means for causing the body to rotate from said first position to said second position; and
(e) means for the addition and removal of water from the body while said second position is occupied.

4,099,274
THERMOPLASTIC ARTICLE HAVING ACCESSIBLE WALL CAVITIES THEREIN FOR RECEPTION AND RETENTION OF SECURING MEANS
John Ernest Emberson, 25 Dogwood Cres., Scarborough, Ontario, Canada (M1P 3N5)
Filed May 9, 1977, Ser. No. 794,732
Int. Cl.[2] E03C *1/26*; F16B *39/00*
U.S. Cl. 4—286 **6 Claims**



1. A thermoplastic article adapted to receive in the intermediate thickness of a wall thereof, in predetermined position, an apertured securing means,
the wall of said article having at least one laterally extending securing means receiving cavity in the intermediate thickness thereof;
and including, in the vicinity of the laterally extending cavity:
a bolt receiving aperture extending transversely from a first lateral wall surface into said laterally extending cavity to permit access of a bolt shank to said laterally extending cavity;
first securing means retaining formations disposed around said bolt receiving aperture and extending transversely from said first lateral wall surface to define the first lateral boundary of said laterally extending cavity;
second securing means retaining formations disposed around said bolt receiving aperture and extending transversely from a second lateral wall surface to define the second lateral boundary of said laterally extending cavity;
said second securing means retaining formations being in transverse alignment with separations between said first securing means retaining formations;
at least one end of the laterally extending cavity communicating through the first lateral wall surface, to permit a securing means to be removably inserted into said cavity to lie in transverse alignment with said bolt receiving aperture;
said laterally extending cavity including means to prevent substantial angular movement of a securing means positioned therein.

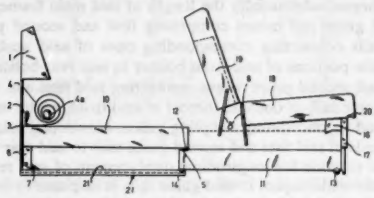
4,099,275
CHAIR CONVERTIBLE INTO A BED
Erwin Pallan, Dietlindestr. 2, Pochlarn, Austria (3380)
Filed Jan. 6, 1977, Ser. No. 757,221
Claims priority, application Austria, Jan. 12, 1976, 157/76
Int. Cl.[2] A47C *17/16*
U.S. Cl. 5—18 R **5 Claims**

1. A chair convertible into a bed, comprising:
a stationary frame having an upright portion provided with a backrest stop;

a seat member positioned on said frame and displaceable relative thereto to extend in a forward direction;

a support member positioned in said frame below said seat member for the support thereof and displaceable thereby to extend in said forward direction, said seat member being connected to said support member;

a body defining a bed-forming surface positioned in said frame below said seat member and above said support member when said members do not extend in said forward direction;



a backrest hinged to said seat member and leaning on said stop in an upright position of the backrest, said backrest being displaceable by said seat member to assume a horizontal position between said body and said seat member on a level therewith, said backrest being pivotally connected to said support member in all positions; and

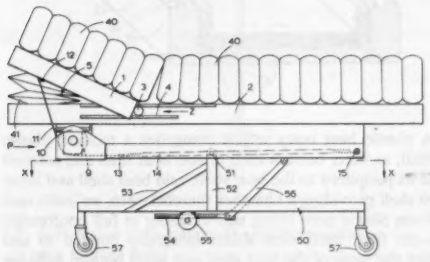
means in said frame for guiding said members for the displacement thereof.

4,099,276

SUPPORT APPLIANCES HAVING ARTICULATED SECTIONS

William Valentine Hunt, Wareham, and Frank Edward Mayhew Ducker, London, both of England, assignors to Watkins & Watson Limited, Wareham, England

Filed Jul. 26, 1976, Ser. No. 708,428
Int. Cl.[2] A61G *7/06*
U.S. Cl. 5—72 **7 Claims**



6. A support appliance, such as a bed, having a head section which is raisable and lowerable with respect to an adjacent section using an inflatable bellows, said appliance including means for maintaining the head section in a predetermined raised position, which comprises;

a bellows adapted to support said head section,

a pressure source,

a first conduit having a first valve therein and connected between said bellows and said pressure source,

a second conduit having a second valve therein and connected between said bellows and said pressure source,

said first valve including a rotatable conduit rotatable between a valve-open and a valve-closed position,

a pulley frictionally engaging said rotatable conduit whereby rotation of said pulley in one sense rotates said rotatable conduit from said valve-open position to said valve-closed position but no further and rotation of said pulley in the opposite sense rotates said rotatable conduit from said valve-closed position to said valve-open position but no further, and

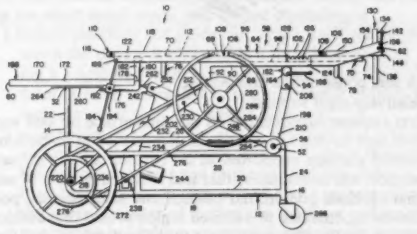
a line connected to said head section and passed around said pulley in such a manner that if said head section falls from said predetermined position, said line rotates said first valve from a valve-closed to a valve-open position, there admitting pressurized air to said bellows and restoring the head section to its predetermined position.

4,099,277

STANDER APPARATUS PROVIDING VARYING DEGREES OF WEIGHT BEARING FOR PATIENT THERAPY

Mervyn M. Watkins, 30241 Via Borica, Rancho Palos Verdes, Calif. 19154

Filed Sep. 30, 1975, Ser. No. 618,076
Int. Cl.[2] A61G *13/00*
U.S. Cl. 5—81 R **12 Claims**



1. Apparatus for providing varying degrees of weight bearing therapy to a patient having a body including an upper body portion and a lower body portion, said upper body portion including a head, a pair of arms and shoulders, said apparatus comprising:

a frame assembly having a front end and a rear end, said frame assembly including a pair of spaced, substantially parallel side frames each having upstanding front and rear frame members and upper, intermediate and lower rails each having an end affixed to an associated one of said front and rear frame members, said frame assembly also including upper and lower transverse rails each having an end affixed to an associated one of the upper and lower ends of said upstanding front frame member;

a roller trapped between an upper rail and an intermediate rail on each of said side frames;

a roller axle connecting said rollers together for rolling movement from said rear end of said frame assembly to a position near said front end of said frame assembly;

a stretcher assembly having a front end, a rear end, a first edge, a second edge and an intermediate portion;

a first strut pivotally connecting said rear end of said stretcher assembly to said roller axle adjacent one of said side frames;

a second strut pivotally connecting said rear end of said stretcher assembly to said roller axle adjacent the other of said side frames;

a third strut pivotally connecting said intermediate portion of said stretcher assembly to one of said side frames adjacent the juncture of one of said lower rails and said front frame member;

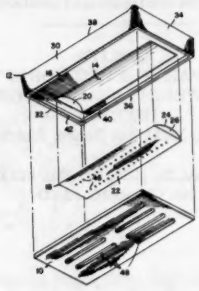
a fourth strut pivotally connecting said intermediate portion of said stretcher assembly to the other of said side frames adjacent the juncture of the other of said lower rails and said front frame member; and

a lifting device connected to said stretcher assembly adjacent its front end for exerting an upward force on the front end of said stretcher assembly to move it from a horizontal position to a near-vertical position.

4,099,278
SEAT CONSTRUCTION

Joseph J. Parisi, c/o Parisi, Inc., 10521 Drummond Rd., Philadelphia, Pa. 19154

Filed Jun. 2, 1977, Ser. No. 802,718
Int. Cl.[2] A47C *27/00*
U.S. Cl. 5—361 B 14 Claims

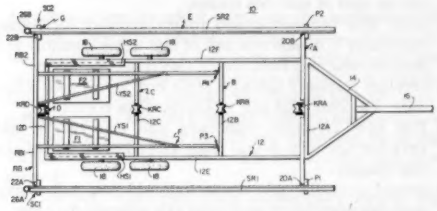


1. A seat construction comprising:
a relatively rigid support,
a first cushion supported at its bottom surface on said support and having a recessed portion formed in its bottom,
a second cushion supported at its bottom surface on said support and contained within said recessed portion of said first cushion, said second cushion and said recessed portion being confined to a limited region of said first cushion with a depth substantially less than the depth of said first cushion,
said first cushion made of a resilient material,
said second cushion being made of a resilient material softer than said first cushion, and
a cover enclosing the outer surface of said first cushion and secured to said support.

4,099,279
BOAT LAUNCHING AND RECOVERY GUIDE FOR BOAT TRAILERS

W. Sidney Park, 513 Morningside Dr., Louisville, Ky. 40206

Filed Jul. 26, 1977, Ser. No. 819,148
Int. Cl.[2] B60P *1/52*
U.S. Cl. 9—1.2 10 Claims

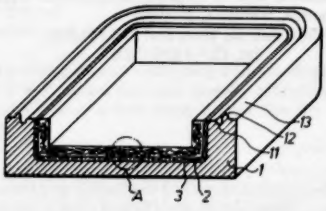


1. In a boat launching and recovery trailer having a wheeled main frame for engaging the bottom of a body of water and a floating frame section for assuming the attitude of the surface relative to the main frame, the improvement comprising:
a plurality of transverse integral cross-braces spaced from front to rear of said main frame;
front bolster means transversely affixed to a forward cross-brace on the main frame of the trailer and having a contour conforming to the hull of a boat to be launched and recovered by the said trailer;
a floating frame having first and second forward pivot means affixed by the latter to an intermediate one of said cross-braces and extending rearwardly to an integral rear bolster means transversely disposed at the rear end of said frame and having a main hull-shaped contour for recovering and launching a boat therethrough on and from said trailer;
said floating frame including float means adjacent said rear bolster means;
said front and rear bolster means each including upstanding arm portions on opposite sides of said main frame; and
guide rail means interconnecting said front and rear bolster means for guiding a boat during launching and recovery thereof substantially the length of said main frame;
said guide rail means comprising first and second parallel rails connecting corresponding ones of said upstanding arm portions of said front bolster to said rear bolster, first and second pivot means connecting said first and second guide rails at one end thereof to said front bolster and first and second sliding coupling means connecting said other ends of said first and second guide rails to said rear bolster to provide for longitudinal displacement of said rear bolster with respect to said guide rails in response to flotation of said floating frame relative to said main frame.

4,099,280
HULL, MOLD THEREFOR, AND PROCESS FOR PRODUCING SAME

Peter Hoppe, Troisdorf; Helmut Leyer, Opladen, and Johann Müller, Koeln-Flittard, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany.

Division of Ser. No. 219,277, Jan. 20, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 532,132
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1971, 2104585; May 7, 1971, 2122581
Int. Cl.[2] B63B *5/24*
U.S. Cl. 9—6 P 8 Claims



5. A plastic boat body which comprises a molded plastic boat shell, an inner bottom shell in said boat shell and secured around its periphery to the boat shell, said boat shell and inner bottom shell providing a chamber therebetween, an insitu cast hard foam plastic core filling said chamber in full conformity therewith, fiber lamination sheets integrally bonded to and covering the faces of the boat shell and inner bottom defining said chamber, plastic from the boat shell and inner bottom shell being embedded in interstices of said fiber lamination sheets, and fibers of said lamination sheets surrounded by the cast foam plastic core and embedded therein in locked relation therewith to integrally bond the foam plastic core to the boat shell and inner bottom.

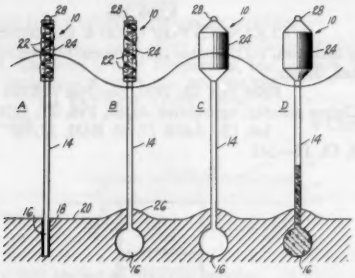
4,099,281
NAVIGATIONAL BUOY

Wallace W. Bowley, Stafford Springs, Conn., assignor to Hydra Corporation, Boston, Mass.

Filed Oct. 7, 1976, Ser. No. 730,670
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R 2 Claims

1. A navigational buoy which comprises an inflatable buoy and an inflatable anchor connected by a stem comprising a hollow member adapted to provide fluid communication with

the interior of said anchor and said buoy, said stem having sufficient mechanical strength to support said buoy and means



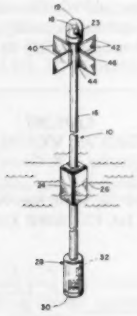
for rendering said stem sufficiently flexible to withstand time-varying loads exerted by wind and water, said means comprising a flexible material for forming said stem.

4,099,282

FLOATABLE POLE MARKER BEACON

Richard E. Townsend, 874 San Antonio Pl., San Diego, Calif. 92106

Filed May 9, 1977, Ser. No. 795,049
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8.3 E **5 Claims**



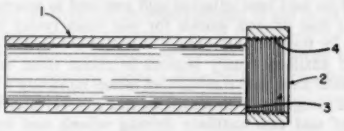
1. A floatable pole marker beacon comprising:
a long hollow pole;
a float fixedly secured to said pole at an intermediate position;
an electric light mounted on an upper end of said pole;
a container sealably mounted at the bottom end of said pole;
a source of electrical power housed within said container;
an electricl circuit connecting said power source and the light source;
said circuit including a magnetically operable switch biased to a closed position, said switch being maintained in an open position by the presence of a predetermined magnetic force;
said switch being mounted within the container, and a holder is provided for storing the container, said holder having a magnet aligned with said switch when the beacon is in a stowed condition in the holder;
whereby deployment of the beacon from the holder will automatically close the switch to energize the light source.

4,099,283

DEVICE FOR CENTERING AND MAINTAINING SHORT SPOOL PIECES

Dale Allen Jueckstock, Sanford, and Thomas Wayne Hindman, Sr., Gladwin, both of Mich., assignors to Robert L. McKellar, Midland, Mich., a part interest

Division of Ser. No. 661,293, Feb. 25, 1976, Pat. No. 4,028,762. This application Mar. 10, 1977, Ser. No. 776,191
Int. Cl.[2] B23G *1/22*; B23B *31/00*
U.S. Cl. 10—107 PH **3 Claims**



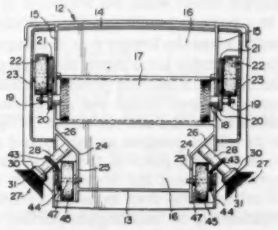
1. A device for centering and maintaining short spool pieces in a conventional threading machine while cutting and threading the short spool piece, said device consisting of
a hollow stabilizer and guide bar, which stabilizes the device when the device is clamped in a threading machine, having a length of 9 inches or greater, an outside diameter of from 1¾ to 6¾ inches and an inside diameter of from ⅛ to ¼ inches smaller than the outside diameter,
a workholder, which is circular in structure and which has an outside diameter greater than the outside diameter of the hollow stabilizer and guide bar and which has a standard threaded inside diameter of ⅛ to ¼ inch greater than the inside diameter of the hollow stabilizer and guide bar in order to hold short pieces of threaded pipe securely,
said workholder having a length which is dependent on the diameter of the short spool piece being processed, which in turn is dependent upon the length of exposed lining that is desired in the short spool piece,
said workholder being axially aligned and permanently affixed to one end of the stabilizer and guide bar. said one end of said stabilizer and guide bar extending radially inwardly beyond the inside threaded diameter of said workholder to form a planar lip against which a leading edge of one end of said spool piece is seated and said length of exposed lining extends into said guide bar when said spool piece is positioned in the device for cutting and threading an opposite end thereof.

4,099,284

HAND SWEEPER FOR CARPETS

Mamoru Shinozaki, Tokyo; Yuichi Takahama; Hachiro Tubaki, both of Kawagoe; Kazuo Nagasawa, and Yasao Mikami, both of Tokyo, all of Japan, assignors to Tanita Corporation, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,768
Claims priority, application Japan, Feb. 20, 1976, 51-19715[U]; Mar. 16, 1976, 51-31880[U]
Int. Cl.[2] A47L *11/33*
U.S. Cl. 15—42 **3 Claims**



1. A hand sweeper comprising a body having a handle pivot-

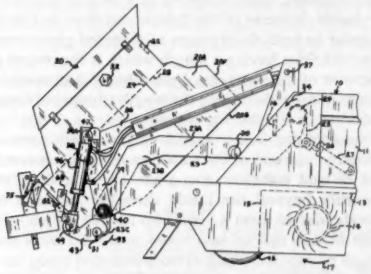
ably connected thereto, a base removably connected to said body, said base having a front end and a rear end and forming a dust box, a main rotary brush extending across said dust box, driving wheels on said base adjacent said rear end for rotating said main rotary brush to sweep dust into said dust box, auxiliary rotary brushes rotatably mounted on said base at its forward corners, each of said auxiliary rotary brushes including a horizontal shaft fixedly supported on the base and extending forwardly and outwardly from the base and at an oblique angle with respect to said main rotary brush, a boss rotatably mounted on said shaft, auxiliary driving wheels rotatably supported on said base adjacent said rear end in spaced relationship to said driving wheels for said main rotary brush, and means for transmitting rotation of said auxiliary driving wheels to said auxiliary rotary brushes to rotate them around said horizontal axes, said transmitting means including a bevel gear formed integrally with said boss, and a bevel gear formed on each of said two auxiliary driving wheels and respectively meshing with said bevel gear on said auxiliary rotary brush.

4,099,285

HIGH LIFT SURFACE MAINTENANCE MACHINE

Bryan L. Christensen, Bloomington; William J. Sampson, Osseo; Ronald L. Brogger, Minneapolis, and Jeffrey A. Lee, Crystal, all of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Mar. 7, 1977, Ser. No. 774,981
Int. Cl.² E01H *1/04*
U.S. Cl. 15—83 **20 Claims**



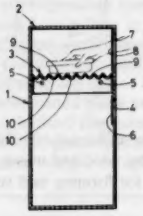
1. A surface maintenance machine comprising a vehicle having a frame, means on the frame defining a downwardly opening sweeping enclosure that has a debris outlet, a debris hopper having a debris inlet and a debris outlet remote from the debris inlet, powered arm means mounted on the frame for supporting the hopper in a street level position so that the debris inlet is adjacent the enclosure outlet and mounting the hopper for pivotal movement relative thereto, means for selectively pivoting the hopper relative the arms means between a dumping position relative the arm means for discharging debris through the hopper discharge outlet, and a non-dumping position, and controlling the pivotal positions of the hopper relative the arm means, a door, means for mounting the door on the hopper for movement under gravity from a position closing the hopper outlet when the hopper is in its non-dumping position to a position permitting debris discharge through the hopper outlet when the hopper is in its dumping position, a lug on the door, operable latch means mounted on the hopper for movement between a latching position latchingly engaging the lug to retain the door closed and a lug release position, and means connected to the control means for operating the latch means to its release position as the control means pivots the hopper to its dumping position, the hopper having a parimetric flange portion defining the hopper outlet, and door holder means for retaining the door in its open position in substantial spaced relationship to said hopper portion after the control means has operated the latch means to its release position and until the control means has operated the hopper back to adjacent its non-dumping position, and thence release the door to allow it to close.

4,099,286

CLEANERS FOR CHALK ERASERS

Soji Ishikawa, 1-22, Chohai-cho, Minami-ku, Nagoya-shi, Aichi-ken, Japan

Filed Feb. 28, 1977, Ser. No. 773,130
Claims priority, application Japan, Feb. 27, 1976, 51-23791
Int. Cl.² A46B *17/06*; B43L *21/00*
U.S. Cl. 15—142 **5 Claims**



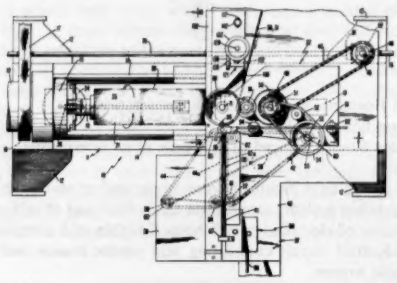
1. A cleaner for a chalk eraser comprising an upper case having an open bottom and formed on one side with an aperture through which a chalk eraser is put into said upper case, a member of elastic material closing said aperture and which can be spread open to insert the chalk eraser through said aperture, a lower case having an open top and removably connected with said upper case and a cleaning plate positioned at the juncture of said upper and lower cases and provided with a plurality of alternately arranged ridges and slots opening into said lower case and wherein said lower case is formed on one side with an opening normally closed by a depending flap through which wastepaper may be thrown into said lower case.

4,099,287

CYLINDRICAL WOUND BRUSH

Harvard W. K. Enchelmaier, 4 E. Greenbrook Rd., N. Caldwell, N.J. 07006

Filed Oct. 28, 1976, Ser. No. 736,483
Int. Cl.² A46B *3/00*
U.S. Cl. 15—182 **9 Claims**



1. A cylindrical cord bound brush having a core with bristles projecting outwardly therefrom, each of the bristles being in the form of a single substantially straight length of strand extending only from its inner root end near the core to its outer end disposed radially outwardly of the core, all of the bristles being arranged in zones of substantial length axially of the brush core, said zones extending circumferentially of the brush, extending at substantially the same substantial angle with respect to radii of the core, the roots of the bristles being

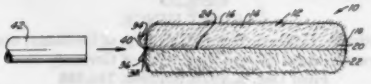
held between the turns of at least one bristle-holding cord wound on the core.

4,099,288

DUST MITT WITH OPTIONAL HANDLE

Max Rittenbaum, Atlanta, and Jeffrey A. Rittenbaum, Marietta, both of Ga., assignors to Max Rittenbaum, Inc., Atlanta, Ga.

Filed Apr. 5, 1977, Ser. No. 784,805
Int. Cl.[2] A47L *13/16, 13/20*
U.S. Cl. 15—228 4 Claims



1. In a dust mitt having an optional handle:

a mitt constructed from a nappy fabric in three-dimensional form and having a three-dimensional space in the interior thereof defining a pocket therein, said pocket having a closed front except for a small opening to the interior,

a stuffing inside said pocket in the three-dimensional space therein comprising a sheet of elongated soft, resilient foam material, such as foam plastic, folded substantially in half upon itself to create a smooth marginal edge at one end and an open space aligned with the opening at the other end leading to the interior thereof,

an elongated handle inserted through said opening into and between portions of said frictionally held folded resilient foam material and being removable therefrom,

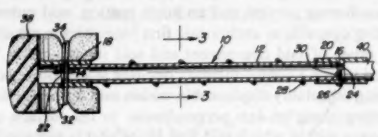
and a small puckered mouth leading to said opening.

4,099,289

TOOL HAVING REMOVABLE CLEANING ELEMENT

Harry Bretthauer, Carson City, Nev., assignor to James B. Manning, Carson City, Nev., a part interest

Filed Mar. 7, 1977, Ser. No. 775,060
Int. Cl.[2] A47L *13/46;* B25G *1/12*
U.S. Cl. 15—244 R 10 Claims



1. A cleaning tool comprising an elongated rod, a pair of end members rotatably mounted on the opposite ends of said rod, said opposite ends including first endwise outwardly facing abutment friction surfaces, said end members including second abutment friction surfaces opposing and frictionally engaged with the corresponding first friction surfaces, and an elongated flexible tension member anchored at its opposite end portions to said end members and spiraled about said rod intermediate said end members, one of said opposite end portions including a looped portion and a cleaning element anchored to one of said end members by said looped portion of said tension member which is tightened thereabout by rotating one of the end members relative to the rod.

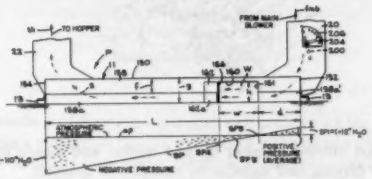
4,099,290

SWEEPER WITH RECIRCULATION HOOD HAVING AN UNOBSTRUCTED PICKUP WINDOW

Jan A. Hiszpanski, Upland, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed May 13, 1977, Ser. No. 796,584
Int. Cl.[2] A47L *5/14*
U.S. Cl. 15—340 15 Claims

9. In a mobile street sweeper or the like of the type comprising a vehicle carrying a hopper, a dust filter chamber opening to said hopper and containing filters, means for periodically cleaning the filters, sweeper means comprising an elongate, transversely disposed debris pickup hood of the air recirculation type comprising a closed end duct with front and rear walls having flexible surface engaging flaps, blower means including a main blower for withdrawing air from the hopper and introducing the air under pressure through an air delivery line to a zone adjacent the upstream end of the hood, an auxiliary blower for withdrawing filtered air from said filter chamber and exhausting it to the atmosphere, means for driving said blowers, an air return line adjacent the other end of the hood for returning air from the downstream end of the hood to the hopper thereby causing a stream of air to flow along the hood, a bulky object admitting window formed in the front wall of said duct, said window being substantially shorter than the duct and having upstream and downstream ends and means for



windrowing objects into said window; the improvement wherein said blower means, blower drive means, air delivery line, hood and air return line produce an air flow rate that provides a first zone intermediate the length of said duct wherein the static pressure of said air stream substantially equals atmospheric pressure, the static pressure of said air stream downstream of said first zone becoming progressively more negative relative to atmospheric pressure, the upstream edge of said window being disposed substantially at said first or atmospheric pressure zone of said duct, the downstream edge of said window being disposed at a second zone along said duct wherein the static pressure of said air stream is slightly less than atmospheric pressure but is substantially greater than the negative static pressure of said air stream at said air return line, said window being unobstructed during normal operation of the sweeper for freely admitting bulky objects along with a small stream of air.

4,099,291

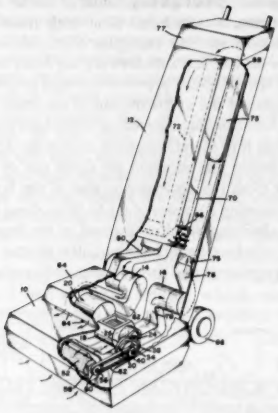
VACUUM CLEANER HAVING MAGNETIC DRIVE FOR AGITATOR BRUSH

Leonard E. Bowerman, 282 Glen Ridge Rd., Fairfield, Conn. 06430

Filed Jun. 1, 1977, Ser. No. 802,413
Int. Cl.[2] A47L *5/30*
U.S. Cl. 15—390 10 Claims

1. In a vacuum cleaner, a suction nozzle, a surface agitator rotatably mounted in said nozzle, an electric motor, a circuit for supplying current to said motor, a magnetic torque-limiting

drive having a driving member including a magnet and a driven member including a magnet, means for positively driving said driving member by said motor, and means for positively driving said agitator by said driven member.



4,099,292

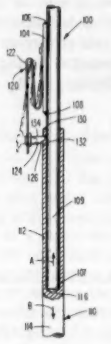
TELESCOPING HEAT RESPONSIVE RELEASING MEANS

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Continuation-in-part of Ser. No. 676,483, Apr. 13, 1976, Pat. No. 4,041,570, and a continuation-in-part of Ser. No. 676,413, Apr. 13, 1976, Pat. No. 4,040,304. This application Mar. 18, 1977, Ser. No. 779,044

Int. Cl.[2] E05F *15/20*

U.S. Cl. 16—48.5 **9 Claims**



1. A heat responsive releasing device, comprising:

(a) a mounting member;

(b) a pawl member slidably engaging said mounting member, said pawl member tracking relatively along said mounting member between at least restrained and activated positions defined along said mounting member; and

(c) bimetallic means mounted on said mounting member for restraining said pawl member relative to said mounting member in response to a preselected normal ambient temperature and for releasing said pawl member in response to at least a preselected increase in said ambient temperature whereby said pawl member and said mounting member may then slide relative to each other, said bimetallic means further comprising a latching means for at least receiving and engaging at least a portion of said pawl member when said pawl is moved relatively away from said actuated position into said restrained position and in response to at least said normal temperature, said bimetallic means further comprising a bimetal, and said latching means further comprising a pin attached to said bimetal, said pin having at least one beveled surface and said pawl having at least one recess defined therein adapted to receive said pin when said pawl is in the restrained position relative to said mounting member and said ambient temperature is said normal temperature.

4,099,293

CABINET HINGE

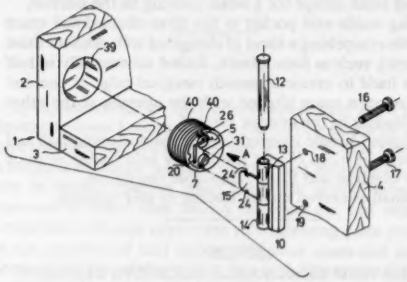
Willi Pittasch, Herford, Westf., Fed. Rep. of Germany, assignor to Firma Richard Heinze, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,938

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554129; Dec. 2, 1975, 2554130; Dec. 2, 1975, 2554133; Jun. 3, 1976, 2624841

Int. Cl.[2] E05D *7/12*

U.S. Cl. 16—149 **23 Claims**



1. A hinge for articulated connection of two components comprising a first hinge part, a second hinge part and a hinge arm pivotally mounted on said second hinge part, said second hinge part having means operable to fix said second hinge part to one of said components and said first hinge part having an outer anchoring portion and an inner portion, said outer portion being operable to anchor said first hinge part in a bore hole of the other of said component and said inner portion being disposed within a complementary opening in said outer portion and being adjustably displaceable within said outer portion for positioning along an axis perpendicular to the surface of the component within which said first hinge part is mounted, said inner portion having a recess operable to receive said hinge arm and locking means operable to retain said hinge arm in said recess.

4,099,294

METHOD OF SKINNING SMALL ANIMALS

Gilbert L. Taber, R.D. 2, Lock Pit Rd., Clyde, N.Y. 14433

Filed Jul. 20, 1977, Ser. No. 817,268

Int. Cl.[2] A22B *5/16*

U.S. Cl. 17—50 **8 Claims**

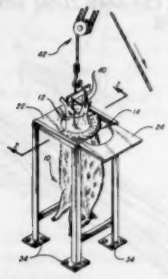
1. A method of skinning small animals with the aid of first and second rigid plate members each having an opening through which the body of the animal may pass, said method comprising:

(a) manually beginning hide removal by peeling away from the carcass a short section of hide about the animal's hindquarters;

(b) passing the animal's hind legs through the opening in a first of said plate members from a first side thereof leaving said short section of hide on said first side;

(c) placing said short section of hide about said first plate member from said first side thereof, over the outer periphery and upon the second side;

(d) rigidly supporting the second plate member in a fixed position;
(e) passing the animal's hind legs through the opening in said second plate member from a first side thereof;
(f) positioning said first plate member in juxtaposition with said second plate member with the openings in the two



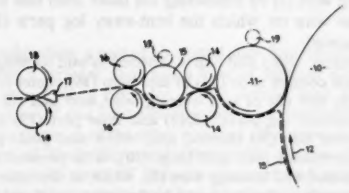
substantially aligned and said short section of hide firmly engaged between said first plate member second side and said second plate member first side; and
(g) pulling the carcass in said first direction completely through the aligned openings in said plate members, with said hide section remaining engaged therebetween.

4,099,295

A METHOD OF REMOVING A CARDING WEB FROM A CARDING MACHINE

John Pickles, Halifax, England, assignor to Crosrol Limited, Halifax, England

Continuation of Ser. No. 442,590, Feb. 14, 1974, abandoned. This application Jan. 28, 1976, Ser. No. 653,016
Claims priority, application United Kingdom, Jul. 18, 1973, 34207/73
Int. Cl.² D01G *15/46*
U.S. Cl. 19—106 R **5 Claims**



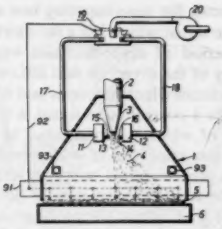
1. A method of removing a carded web of cotton type fibers in full width from a cotton type carding machine comprising stripping said web from a doffer by means of a first card clothing covered stripping roller adjacent said doffer, said web adhering to said first stripping roller, passing said web through a pair of crushing rollers adjacent said first stripping roller, said crushing rollers pulling said web from said first stripping roller, said web sticking to said crushing rollers, then passing said web partially around said second card clothing covered stripping roller, said second stripping roller pulling said web from said crushing rolls, said web sticking to said second stripping roller, feeding said web between a pair of spaced apart control rollers which pull said web from said second card clothing covered stripping roller and direct and control the direction of travel of the web, said control rollers being spaced apart sufficiently to prevent said web from sticking to said spaced apart control rollers.

4,099,296

METHOD AND APPARATUS FOR FORMING A MATERIAL WEB

Lennart Gustavsson, Vaxjo, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Sep. 21, 1976, Ser. No. 725,276
Claims priority, application Sweden, Sep. 26, 1975, 7510795
Int. Cl.² D04H *1/00*
U.S. Cl. 19—304 **33 Claims**



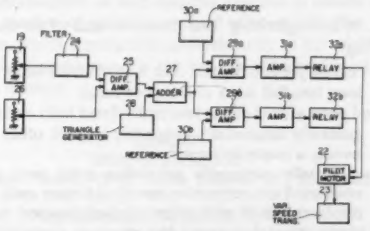
1. A method of forming a material web comprising the steps of causing a composite flow of particulate material in a gaseous transport medium flow into a distribution chamber, precipitating said material from said composite flow on a deposition surface in the distribution chamber, exposing the composite material flow to control flows of gaseous medium directed from opposite sides of the flow against the same, and alternatingly varying the size of the impulse of the control flows with a frequency in the range of 1 to 50 c.p.s., each control flow consisting of a plurality of jets, where the impulse of selected jets being varied separately from one another, the variations in said selected jets being out of phase, whereby the composite material flow is distributed across the width of the deposition surface.

4,099,297

METHOD AND APPARATUS FOR CONTROLLING THE SLIVER-THICKNESS VARIATION IN A CARDING MACHINE

Junzo Hasegawa, Obu; Yasutaka Hayashi; Yasuhiko Suzuki, both of Nagoya; Takashi Katoh, Kariya; Takahiko Tsunekawa, Aichi, and Akira Tanaka, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of, Japan

Filed Sep. 3, 1976, Ser. No. 720,351
Claims priority, application Japan, Sep. 6, 1975, 50-108242
Int. Cl.² D01H *5/38*
U.S. Cl. 19—240 **12 Claims**



1. An apparatus for controlling the sliver-thickness variation in a carding machine, comprising:
a first device for detecting the thickness of the sliver delivered from the carding machine and creating a corresponding electric signal;
a first control circuit for producing a difference signal by

comparing said electric signal indicating the thickness of the sliver with a reference level signal indicating a predetermined constant thickness of the sliver;

a second control circuit for creating a control pulse signal in accordance with said difference signal intermittently at time intervals, each of said time intervals being shorter than a time required for a length of carded sliver to be delivered, which length corresponds to a long term variation of sliver thickness, said second control circuit comprising:

a first circuit for superimposing one alternating current periodic signal which has a far shorter period than the long period of sliver-thickness variation during the delivery of the sliver, on said difference signal;

a second circuit which processes said difference signal and produces a control pulse signal, a time-related characteristic of which is proportional to a time interval in which the amplitude of said superimposed signal exceeds a predetermined reference level; and

a second device for intermittently adjusting the supply amount of fiber tufts to the carding machine by said control pulse signal at each of said time intervals for reducing said difference signal toward zero,

whereby the supply amount of the fiber tufts to the carding machine is intermittently controlled by aid control signal so as to equalize the thickness.

4,099,298

SELF TIGHTENING ELASTIC CLAMP, PARTICULARLY A HOSE CLAMP

Aurelio Helde Gimenez, Rua Araguaia n. 674, Bairro de Caninde Sao Paulo, S.P., Brazil

Filed Mar. 17, 1977, Ser. No. 778,716

Int. Cl.² F16L *33/20*

U.S. Cl. 24—27 **11 Claims**

1. A self-tightening hose clamp formed of an elastic wire having:

a central portion formed into a continuous helix having at least two full turns of the same hand;

end parts at each of the two ends of said helix and extending generally tangentially oppositely to each other and each having a respective outer end;

two radially outwardly projecting grips each indirectly connected to a respective one of said outer ends, whereby displacement of said grips angularly toward each other elastically deforms said two turns so as to increase the diameter thereof; and

two bent portions each connecting a respective one of said outer ends to a respective one of said grips embracing and thereby restricting axial deformation of said two turns, said bent portions each riding on said two turns during elastic deformation thereof effected through said grips.

4,099,299

ELASTICALLY RESILIENT FASTENING CLIP

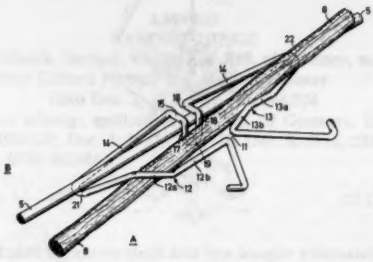
Paul Bruggert, 19, rue Thierenbach, 68500 Jungholtz, and Georges Schuller, 26 rue, Kreuzberger, 68500 Guebwiller, both of France

Filed Nov. 8, 1976, Ser. No. 739,974

Claims priority, application Switzerland, Nov. 10, 1975, 14540/75

Int. Cl.² A44B *21/00*; A01G *17/10*

U.S. Cl. 24—73 PS **7 Claims**



1. An elastically resilient fastening clip, in particular for the fastening of a trained plant including fruit trees, vines, or the like to a horizontally extending training wire, said clip comprising a slit loop (10) having a slit (11) which is widenable outwardly for introduction of a sapling, a twig, a shoot or the like part (8) of said plant and, after passing the plant part (8) therethrough, closes again under the clamping effect of said loop (10) of said fastening clip exercised at both sides of said slit (11); and said clip further comprising hook parts (23,24) bent at angles away from said slit (11) in said loop (10); said loop (10) having an elongated compressed or flattened shape in the plane in which the loop extends, and further comprising:

(a) a contact zone (14) extending opposite said slit (11) and approximately parallel to said training wire (5),

(b) two crimped intermediate leg zones (12,13) between the ends of said contact zone (14) and said slit (11), and

(c) a hook-shaped projection (17,18,19) having a nose part (19) bent out of the plane of the loop in the middle of said contact zone (14), said nose part (19) lying opposite said slit (11), being adapted for being hooked on to said training wire (5) by contacting the latter from that side (A) of the wire on which the bent-away leg parts (12,13) are located;

whereby, when said clip is fastened to said training wire (5), said contact zone (14) of said loop (10) comes to lie along one side (B) of said training wire, and said slit (11), said adjacent leg parts (12,13) and nose part (19) are on the other side (A) thereof, and, when said plant part (8) is introduced into said loop (10), it is pressed resiliently against said training wire (5), while, at the same time, the clamping tension caused by the insertion of said plant part (8) pulls said contact zone (14) into frictional contact with said training wire (5) and thereby prevents a lateral displacement of said clip along said training wire (5).

4,099,300

TIE PIN

Edward A. Wolak, 7708 Normile, Dearborn, Mich. 48126

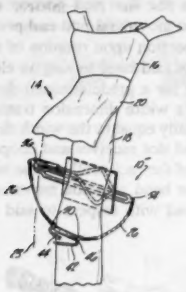
Filed May 13, 1977, Ser. No. 796,836

Int. Cl.² A41P *25/04*

U.S. Cl. 24—49 CF **5 Claims**

1. A tie pin for holding the wide front and the narrow rear portions of a tie relative to a wearer's shirt comprising: a pin element adapted for attachment to selected portions longitudinally and at the rear of the wide front portion of the tie, a clamp member to grip opposed surfaces at the edge of a shirt front and at selected points vertically of the shirt, flexible means extending from opposite ends of said clamp member to

said pin element to form a closed loop adapted to receive and confine the short end of said tie to limit lateral displacement



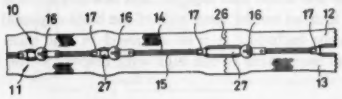
thereof relative to said shirt front and said front portion of said tie, said flexible means extending from said clamp member to opposite ends of said pin element.

4,099,301

SLIDE FASTENER COMBINATION

Yoshinori Fujisaki, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Nov. 15, 1976, Ser. No. 741,847
Claims priority, application Japan, Nov. 22, 1975, 50/158718
Int. Cl.[2] A44B *19/02, 19/36*
U.S. Cl. 24—205 R **3 Claims**



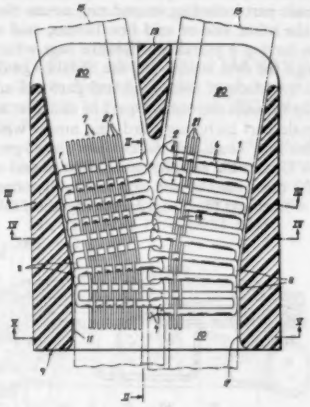
1. In combination; a pair of elongated slide fastener stringers each having a stringer tape and a row of fastener elements mounted on and along one edge of said stringer tape, the fastener elements of one row and tape being interlockable with the fastener elements of the other row and other tape; a plurality of pairs of dissimilar coupler-decoupler devices slidably mounted on said rows of fastener elements and moveable therealong to selectively couple into interlocking engagement and decouple from such interlocking engagement the fastener elements within lengthwise portions of said rows thereof, each coupler-decoupler device having a head end at and from which said rows of fastener elements extend in separated, decoupled relation, and a rear end at and from which said rows of fastener elements extend in interlocking, coupled relation, said pairs of coupler-decoupler devices being arranged in spaced succession along said rows of fastener elements with the head end of each coupler-decoupler device in each pair facing the head end of a coupler-decoupler device of the next adjoining pair thereof whereby lengthwise portins of said rows of fastener elements extending between the head ends of coupler-decoupler devices of adjoining pairs thereof, are maintained in separated, decoupled relation, and lengthwise portions of said rows of fastener elements extending between the rear ends of the coupler-decoupler devices of the same pair thereof, are maintained in coupled, interlocking relation.

4,099,302

SLIDE FASTENER

Alfons Fröhlich, and Walter Passmann, both of Essen, Fed. Rep. of Germany, assignors to OPTI Patent- Forschungs- und Fabrikations-AG, Glarus, Switzerland

Filed Sep. 10, 1976, Ser. No. 722,048
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2540201; Jun. 19, 1976, 2627640
Int. Cl.[2] A44B *19/32*
U.S. Cl. 24—205.15 R **9 Claims**



1. A slide fastener comprising, in combination:

a pair of tape-like support units each comprising a continuous monofilament row of coupling elements, each coupling element having a loop-forming eye provided with a coupling head, a pair of eye-forming monofilament segments on opposite side of said head, connecting shanks extending from said segments and bights spaced from said head and connecting shanks of adjacent coupling elements, and longitudinal threads forming pockets receiving said shanks, said heads projecting along one edge of each unit; and

a slider shiftable along said units for interdigitating and separating the coupling heads of said rows, said slider comprising a shield lying along one side of said units, a pair of flanges overhanging the other side thereof and connected to said shield, and a divider, said slider defining in the region of said divider respective channels adapted to receive each of said units and oriented to press the heads of one of said rows between the heads of another of said rows in a direction transverse to the slide fastener plane, said units being so constructed and arranged that the spreadability of said coupling elements is limited to a free spacing of said segments of adjacent coupling elements which corresponds approximately to the width of said head as measured in the longitudinal direction of the slide fastener.

4,099,303

SNAP FASTENER

Pedro Pere Parera, 79-81 Pablo Alcover St., Barcelona-17, Spain

Filed Apr. 11, 1977, Ser. No. 786,089
Claims priority, application Spain, Feb. 15, 1977, 226.417
Int. Cl.[2] A44B *17/00*
U.S. Cl. 24—217 R **6 Claims**

1. An improved snap fastener for permitting first and second laminae to be releasably secured together, said snap fastener comprising a female part which is fixable to the first lamina without having to preform a hole therein and a male part

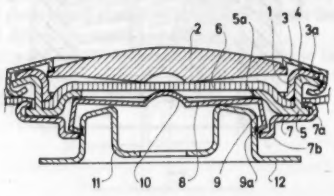
which is fixable to the second lamina, comprising the improvement wherein:

said female part includes a first ring means which is fixedly positioned adjacent one side of said first lamina, said first ring means including a substantially cylindrical part which projects away from the first lamina and defines therein a central opening, the cylindrical part terminating in an annular conical part which flares radially outwardly from the cylindrical part;

said female part including a push button movably positioned within said cylindrical part;

said female part including second ring means disposed adjacent the other side of said first lamina, said second ring means having a plurality of pinlike lugs which penetrate through the first lamina and are slidably guided past the exterior surface of the cylindrical part and are bent outwardly beneath the conical part of said first ring means;

said female part including third ring means which overlies the first ring means and has an outer flange portion which wraps around the radially outer edge of said conical part and the outer ends of said lugs for fixedly connecting said first, second and third ring means together, said third ring



means having a central opening which permits a finger to be inserted therethrough so as to contact the push button;

said second ring means having first and second portions which are positioned on said other side of the first lamina, said first and second portions being axially spaced apart so that said first portion is positioned closely adjacent said first lamina whereas said second portion is spaced therefrom, said first and second portions respectively defining first and second openings which communicate with an enlarged receptacle defined therebetween;

said female part further including a locking member positioned within said receptacle and confined between said first and second portions, said locking member including a resilient reversible disc which is resiliently flexibly movable between raised and lowered stable positions, said locking member further including legs connected to said disc and projecting axially therefrom toward said second portion, said legs terminating in locking projections; and

said male part including a portion insertable through said second opening so as to engage said disc, the portion of said male part having a groove formed for engagement with said locking projections.

4,099,304

SCREW TYPE CLAMPING COLLAR

André R. Luc, Ozoir-la-Ferriere, France, assignor to Tridou-Serflex S.A., Bry-sur-Marne, France

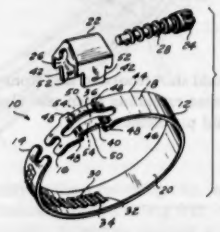
Filed Jun. 3, 1976, Ser. No. 692,334

Claims priority, application France, Jun. 4, 1975, 75 18314

Int. Cl.[2] F16L *33/08*

U.S. Cl. 24—274 R 8 Claims

1. A screw-type clamping collar comprising a flexible band having first and second end portions and inner and outer surfaces; said band having a rack of teeth formed thereon adjacent said first end portion and extending along the band for a predetermined distance, said rack teeth including portions protruding from the inner surface of said band, to be adjacent the part to be clamped; a saddle housing rigidly mounted adjacent the second end portion of said band and having a passage therein for receiving the first end portion of the band above the second end portion thereof; a screw rotatably mounted in said housing and fixed against axial movement thereon, said screw being positioned axially of said band whereby its threads will engage the rack teeth on the first end portion of the band in said housing passage to move said first end portion with respect to said second end portion upon rotation of said screw; said second end portion of said band having an elongated slot formed therein extending for a predetermined distance axially of the band and having a width dimension transversely of the band which is substantially equal to the width dimension of said rack teeth whereby said slot receives and cooperates with the protruding portions of the rack teeth on the inner side of said first end portion of the band to guide movement of said first end portion of the band with respect to said second end portion



during rotation of said screw; said saddle housing having a pair of mounting lugs bent about the band beneath the inner side of the band adjacent said slot to secure the housing to the band; said second end portion of the band adjacent said slot being bent upwardly away from the remainder of the band to form a projection on the outer side of the second end portion of the band and a recess on the inner side thereof, said recess having a depth substantially equal to the thickness of said housing lugs for receiving the lugs whereby the slot is maintained in close juxtaposition to the protruding portions of the rack to receive and guide the same; said lugs on said housing having free end portions located on the inner side of the band adjacent said slot respectively including a boss received in said slot to resist transverse movement of the lugs with respect to the band.

4,099,305

FABRICATION OF MESA DEVICES BY MBE GROWTH OVER CHANNELED SUBSTRATES

Alfred Yi Cho, and Won-Tien Tsang, both of Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 14, 1977, Ser. No. 777,400

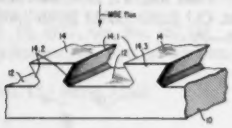
Int. Cl.[2] B01J *17/00;* H01L *21/203, 29/04*

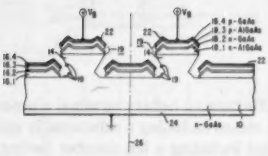
U.S. Cl. 29—579 11 Claims

1. A process for fabricating mesa geometry semiconductor devices comprising the steps of:

forming in a semiconductor body a plurality of channels separated by ridges such that each channel is narrower at its top than at its base, and

directing a molecular beam substantially perpendicular to said body so that epitaxial layers grow simultaneously on





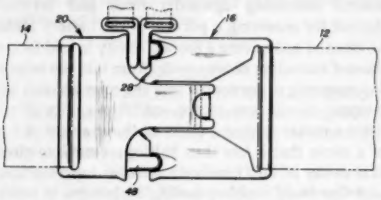
said ridges and in said channels, the layers on the ridges being physically separate from those in the channels.

4,099,306

SAFETY BUCKLE

Frank M. Matthews, 1514 Hillcrest Dr., Arlington, Tex. 76010, and Terry O. McClain, Rte. 4, Box 262, Denton, Tex. 76201

Filed Nov. 21, 1975, Ser. No. 633,970
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—69 SB **11 Claims**



1. A separable buckle adapted to connect two separable belts which normally are maintained in tension when they are connected, comprising:

(a) a first structural member constituting a floating link of given length, with the link being connected to and pivoting about a point at one end of a first belt, and the distal end of said floating link being generally cylindrical so as to foster rotative contact with an abutting structure;

(b) a second structural member including a base plate and a lever which is permanently secured to the base plate in a manner that provides for pivotable movement about a control axis on the base plate, with the control axis being transverse to the orientation of the two belts being joined, and the base plate being connected to an end of the second belt, said lever having a length which extends from a remote free end to a second end adjacent the control axis and said lever having a cusp-shaped opening between its free end and said control axis, with said cusp-shaped opening lying on a line that extends generally between the lever's free end and the control axis, and said cusp-shaped opening being oriented and sized to selectively receive and hold the distal end of said floating link in abutting contact, and the control axis being located such that the buckle is not only unlatched but also tends to separate when the two belts are in tension and the plane of the floating link is positioned above the control axis, and such that the buckle remains firmly latched together when the two belts are in tension and the plane of the floating link is positioned below the control axis; and

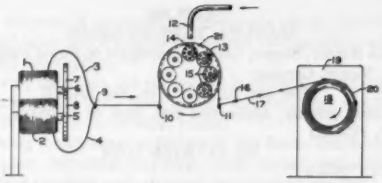
(c) means for manually moving the lever above and below the control axis, with said moving of the lever causing shifting of the floating link when the link's distal end is engaged with the lever, whereby manually displacing the lever through a relatively small angle of as little as 3° can cause the floating link to be shifted to and from a secured state, and the buckle can be thereby changed to and from a latched condition.

4,099,307

APPARATUS FOR PRODUCING SLUBBY YARN

Herbert W. Barch, Natrona Heights, and August G. Bohy, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 749,198, Dec. 9, 1976, which is a continuation-in-part of Ser. No. 639,723, Dec. 11, 1975, which is a continuation-in-part of Ser. No. 582,493, May 30, 1975, abandoned. This application May 26, 1977, Ser. No. 800,989
Int. Cl.[2] D02G *1/16*; D02J *1/06*
U.S. Cl. 28—252 **4 Claims**



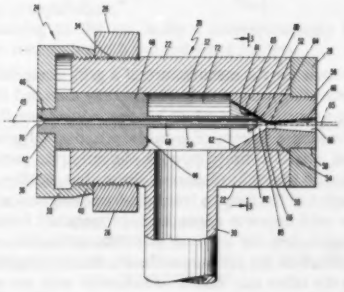
1. An apparatus for producing a slubby strand comprising in combination means to receive a textile strand on a surface, a plurality of fluid passages on said surface, exhaust means for said fluid passages positioned below said surface, means to adjust the volume of exhaust from each of said fluid passage exhaust means, means to rapidly draw said textile strand from said surface and means to introduce high pressure fluid onto said surface while strand is being drawn over said surface.

4,099,308

TURBULENCE GENERATING YARN FEED NEEDLE

John Wesley, Wayne, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,027
Int. Cl.[2] D02G *1/16*; D02J *1/08*
U.S. Cl. 28—273 **13 Claims**



1. In yarn bulking apparatus having a housing with a central axis, an internal cavity, a venturi eccentrically positioned relative to the axis at one end of the housing, a yarn feed opening in a second end of the housing, and means for supplying a pressurized compressible fluid to the internal cavity upstream

of the venturi inlet, an improved device for generating turbulence in the venturi inlet comprising:

first means for generating turbulence in the compressible fluid, positioned in the venturi inlet providing a first stage of turbulence generation;

second means for generating turbulence in the compressible fluid, positioned in the venturi inlet downstream of the first means, providing a second stage of turbulence generation; and

yarn feed needle cantilevered from an upstream end of the internal cavity, extending coaxially through the internal cavity to the venturi inlet, having a yarn feed passage communicating with the yarn feed opening and extending through the yarn feed needle, the second means for generating turbulence being at a distal end of the yarn feed needle and the first means for generating turbulence being upstream of the distal end.

4,099,309

MANUFACTURE OF GRIDS

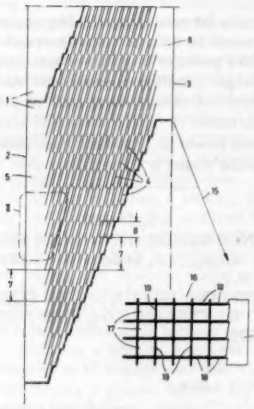
Ulrich Bender, Siegen, Germany, assignor to Firma Emil Bender, Siegen, Germany

Filed Jan. 31, 1977, Ser. No. 764,360

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1977, 2700603

Int. Cl.[2] B21D *31/04*

U.S. Cl. 29—2 3 Claims



1. Process for the manufacture of a grid, comprising:

(a) providing a metal strip of generally diamond shape having opposite edges which are spaced and parallel,

(b) forming a pattern of equal-length, parallel primary slits that extend entirely through the strip, the pattern being also of generally diamond shape, but smaller than the outline of the strip to leave slit-free elongated areas along the said opposite edges, each primary slit having a first neighboring slit on one side that is co-extensive with one-half of the primary slit and a second neighboring slit on the other side that is co-extensive with the other one-half of the primary slit, so that an area of double width appears beside each primary slit, and

(c) deforming the strip by parallel and transverse movement of the slit-free areas in the plane of the strip, thus forming a grid with single-width bars extending transversely of the said area.

4,099,310

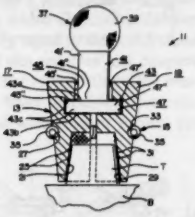
BATTERY TERMINAL CLEANER

Robert Lynn Mitchell, 2300 Fite Rd., Memphis, Tenn. 38127

Filed Aug. 17, 1977, Ser. No. 825,436

Int. Cl.[2] B23D *71/00;* B08B *1/00;* B23B *3/00*

U.S. Cl. 29—79 6 Claims



6. A self-adjusting battery terminal cleaner comprising:

(a) grip means including a substantially spherical grip member and including a leg member having first and second ends, said first end of said leg member being attached to said spherical grip member, said grip means including a substantially plate-like foot member attached to said second end of said leg member, said foot member having four sides positioned at substantially right angles to one another;

(b) body means for selective placement over the battery terminal to be cleaned, said body means including a first body member, said first body member including a face surface having a top edge and a bottom edge, said first body member having a first cavity in said face surface thereof extending upwardly from said bottom edge thereof for receiving a portion of the battery terminal to be cleaned and having a second cavity in said face surface thereof extending downwardly from said top edge thereof for receiving a portion of said leg member and said foot member of said grip means, said first cavity of said first body member having a cross-sectional shape of a portion of a circle that is less than half of a complete circle, said first cavity of said first body member tapering upwardly, said first body member having a plurality of teeth members provided in said first cavity of said first body member, said second cavity of said first body member including a first portion having a cross-sectional shape substantially identical to half the cross-sectional shape of said leg member of said grip means for receiving substantially half of said leg member and including a second portion communicated with said first portion thereof and having a cross-sectional shape substantially identical to half the cross-sectional shape of said foot member of said grip means for nonrotatably receiving substantially half of said foot member; said body means including a second body member, said second body member being substantially a mirror image of said first body member for coacting with said first body member to substantially enclose a portion of said leg member and said foot member of said grip means and the battery terminal to be cleaned; and

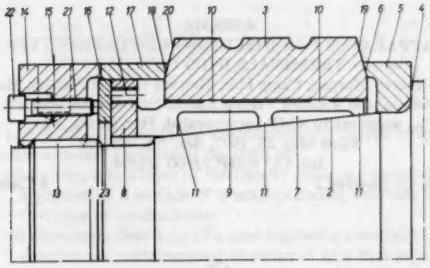
(c) spring means positioned circumferentially about said first and second body members for uniformly urging said face surfaces of said first and second body members of said body means towards one another to cause said foot member of said grip means and the battery terminal to be cleaned to be trapped therebetween whereby manual rotation of said grip means will cause said body means to likewise rotate so that said teeth members of said first and second body members will clean the battery terminal enclosed within said first cavities of said first and second body members.

4,099,311

COMPOSITE ROLL WITH ROLL RING OF MATERIAL WHICH IS SENSITIVE TO TENSILE STRESS

Uwe Kark, Cuxhavener Str. 60a, 2104 Hamburg 92 Hausbruch, Fed. Rep. of Germany

Filed Feb. 11, 1977, Ser. No. 767,731
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2606908
Int. Cl.² B21B *31/08*
U.S. Cl. 29—126 6 Claims



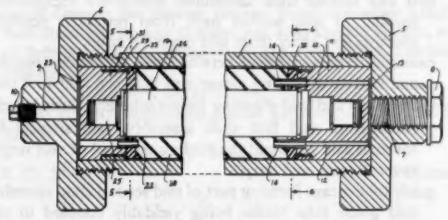
1. A composite roll comprising a coaxial inner roll core and an outer roll ring generally defining an axially tapered annulus therebetween, and intermediate axially tapered means within the axially tapered annulus between and in engagement with the roll core and roll ring for supporting the roll ring on the core, the intermediate axially tapered means being engageable with the inner core and outer roll ring at spaced offset supporting areas respectively and the intermediate axially tapered means forms spring-like means therebetween for resiliently biasing the roll ring radially outwardly at the supporting areas of engagement with the roll ring.

4,099,312

ELASTOMERIC ROLL WITH SEALED ENDS

Robert W. Hill, Sussex; William G. Onnen, Newton, and Lyle C. Ryder, Rockaway, all of N.J., assignors to Ames Rubber Corporation, Hamburg, N.J.

Division of Ser. No. 719,696, Sep. 2, 1976, which is a continuation of Ser. No. 591,720, Jun. 30, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,581
Int. Cl.² B21B *31/08*
U.S. Cl. 29—130 5 Claims



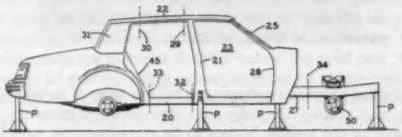
1. An elastomeric roll comprising a cylindrical metal core, a cylindrical elastomeric body surrounding said core and bonded thereto, the length of said cylindrical body being less than the length of said cylindrical core, said cylindrical body being positioned with a portion of said cylindrical core protruding beyond each end of said cylindrical body, and a protective cylindrical sleeve of finished constant diameter throughout its length coaxially surrounding said core and body and continuously bonded to said body, said body comprising end rings of environment-resistive elastomeric material within the ends of said sleeve and continuously and fully closing both ends of the space between said core and sleeve, and the remainder of said body comprising environmentally degradable elastomeric material bonded to said rings, said sleeve having an unstressed initial diameter less than said finished diameter and being circumferentially tensed at said finished diameter by uniform hydrostatic precompression of both the elastomeric materials of said body.

4,099,313

METHOD OF CONVERTING MOTOR CAR

Charles Walter Phillips, Pompano Beach, Fla., assignor to Grandeur Motorcar Corp., Pompano Beach, Fla.

Filed Aug. 9, 1977, Ser. No. 823,170
Int. Cl.² B60P *3/26*
U.S. Cl. 29—416 11 Claims



1. A method of converting a passenger car to provide a shortened body and a lengthened engine compartment which comprises the steps of:

removing the doors, the engine, the front fenders and engine compartment hood from the car and removing the drive shaft from the drive shaft tunnel;

removing longitudinal segments of the frame and body of the car, including the drive shaft tunnel, immediately behind the door posts to sever the car body into front and rear sections;

bringing the severed front and rear sections of the car body into aligned, abutting juxtaposition at the roof and joining corresponding parts of said sections, including the drive shaft tunnel, to each other to provide a converted, unitary car body which has been shortened immediately behind the door posts;

putting a correspondingly shorter drive shaft in the shortened drive shaft tunnel;

closing the openings in the opposite sides of the converted body immediately behind the door posts;

severing the frame transversely at the engine compartment and longitudinally separating the severed rear and front sections of the frame thereat;

inserting longitudinal frame segments between the separated sections of the frame at the engine compartment and joining said inserted frame segments at each end to the adjoining sections of the frame;

mounting the engine on the inserted frame segments at the engine compartment;

and attaching to the car body a correspondingly longer engine compartment hood and front fenders.

4,099,314

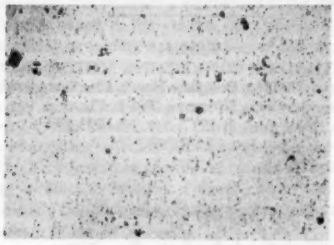
METHOD OF PRODUCING HOLLOW BODIES IN ALUMINUM-SILICON ALLOYS BY POWDER-EXTRUSION

René Perrot, Voreppe, and Jean-Louis Mazodier, Maisons Laffitte, both of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Mar. 4, 1977, Ser. No. 774,424
Claims priority, application France, Mar. 10, 1976, 76 07583
Int. Cl.² B22F *1/00*
U.S. Cl. 29—420 11 Claims

1. A process for preparation of hollow bodies of aluminum-silicon alloy with improved friction and wear characteristics containing crystals of primary silicon of about 2 micrometers to about 20 micrometers comprising the sequential steps of: providing a cast alloy comprised on the basis of weight of 15 to

20% silicon, from 1 to 5% copper, from 0.5 to 1.5% magnesium, from 0.5 to 1.5% nickel and the remainder aluminum; granulating said alloy to provide granular metal having a particle size between about 5 micrometers and about 2 millimeters; introducing the granular metal into the container of an



extrusion press and extruding a hollow tube of suitable diameter; and cutting the tube into lengths corresponding to the length of the hollow bodies to be manufactured, said hollow bodies being characterized by a micrographic structure comprising fine uniformly distributed pores for promoting lubrication by providing zones for retaining lubricant.

4,099,315

PROCESS FOR FIXING THE CENTER OF ROTATION BETWEEN THE LEGS OF TWO-LEGGED DEVICES

Alfred Pudenz, Wanfried, Fed. Rep. of Germany, assignor to B. Braun Instruments, South San Francisco, Calif.

Filed Feb. 28, 1977, Ser. No. 772,577

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611646

Int. Cl.² B23P *11/00*

U.S. Cl. 29—434 **6 Claims**

1. The method of forming a pivotal connection between the legs of a two-legged device in which one of the legs has a mounting passage formed therein and the other of the legs is inserted in said passage and has a pivot opening formed therein; said method comprising the steps of expanding said mounting passage by heating at least the portion of the leg having said passage therein to a temperature of about 900° to 1000° C; inserting a pivot member having opposed spherical surfaces in the pivot opening of the other of said legs; inserting said other of said legs through said mounting passage until said pivot member is within the confines of said passage; and compressing the portion of said leg having the mounting passage therein adjacent said mounting passage towards said other leg to engage said opposed spherical surfaces of said pivot member against the inner sides of said passage.

4,099,316

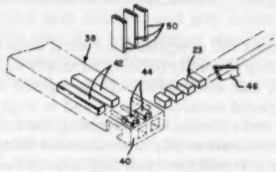
APPARATUS FOR INSERTING DISPLATION TYPE TERMINALS INTO CAVITIES

Joe Pierce Morgan, Camp Hill; Howard Charles Phillips, Harrisburg, and Richard Vernon Spong, New Cumberland, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 23, 1977, Ser. No. 799,838

Int. Cl.² B23P *23/00. 23/04*

U.S. Cl. 29—566.2 **8 Claims**



1. Apparatus for inserting a displation type contact terminal into a cavity in a housing when a wire extends across the open end of said cavity so that said wire moves into the wire receiving slot in said terminal during movement of the terminal into the cavity, said apparatus being of the type having strip feeding means for feeding a strip of said terminals along a first path which extends towards the insertion zone of said apparatus, wire trimming means and terminal insertion means reciprocable along a second path extending towards and away from said zone, shearing means for shearing a terminal from said strip in said zone, and fixture means for holding a workpiece in said zone, said apparatus comprising:

first and second slide assemblies which are reciprocable parallel to said second path from retracted positions towards and away from said insertion zone,

camming means effective between said first slide assembly and said strip feeding means and between said first slide assembly and said shearing means whereby during reciprocation of said first slide assembly, said strip is fed towards said zone and the leading terminal of said strip is severed from said strip,

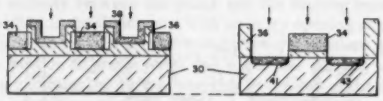
guide tube means forming part of said second slide assembly, said guide tube means being yieldably coupled to said second slide assembly so that upon arrival of said guide tube means in said insertion zone and against a workpiece on said fixture means said guide tube means comes to rest and said second slide assembly continues to move along said second path, said wire cutter means and said inserter means being movable with said guide tube means, said inserter means and said wire cutter means being yieldably coupled to said second slide assembly independently of said guide tube means whereby during a final portion of said work stroke of said second slide assembly, said inserter means pushes said severed terminal into said workpiece and said wire trimming means trim said wire.

4,099,317

METHOD FOR FABRICATING SELF-ALIGNED CCD DEVICES AND THEIR OUTPUT SELF-ALIGNED MOS TRANSISTORS ON A SINGLE SEMICONDUCTOR SUBSTRATE

Stephen C. Su, Huntington Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 5, 1976, Ser. No. 683,361
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **12 Claims**



1. A method of fabricating a semiconductor charge coupled device structure comprising the steps of:

(a) forming a first layer of electrically insulating material on a portion of a surface of a semiconductor substrate of a first type of conductivity;

(b) disposing a first layer of a semi-insulating semiconductor material on predetermined portions of said first layer of electrically insulating material to form a first set of semiconductor strips with predetermined spaces between adjacent strips exposing portions of said first insulating layer;

(c) forming a second layer of electrically insulating material on said first set of semiconductor strips and on said exposed portions of said first insulating layer;

(d) disposing a second layer of a semiconductor material on selective predetermined portions of said second layer of electrically insulating material to form a second set of semiconductor strips which overlie said spaces between said adjoining strips of said first set of semiconductor strips and partially overlie said strips of said first set;

(e) removing portions of electrically insulating material to expose portions of said first set of strips lying under and between said strips of said second set of strips and to expose predetermined portions of said semiconductor substrate; and

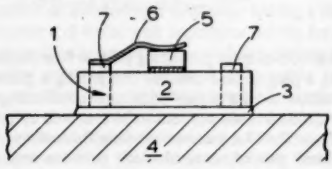
(f) introducing conductivity type determining impurities into both said first set of strips and the exposed substrate to convert the conductivity thereof to a second type of conductivity.

4,099,318

SEMICONDUCTOR DEVICES

Kenneth Cooper; Ian Stanley Groves; Peter Alexander Leigh; Neil McIntyre; Sydney O'Hara, and John Donald Speight, all of Suffolk, England, assignors to The Post Office, London, England

Filed Nov. 15, 1976, Ser. No. 741,672
Claims priority, application United Kingdom, Nov. 17, 1975, 47339/75
Int. Cl.² B01J *17/00*
U.S. Cl. 29—578 **5 Claims**



1. In a method of producing a semiconductor device in the form of an IMPATT diode, the steps of:

selecting a slice of semiconductor material having an epitaxial layer on an n^+ substrate material;

diffusing a p^+ layer into the epitaxial layer to form an abrupt p^+-n junction;

removing the uppermost 80 to 120Å of the diffused p^+ layer by RF sputter etching under plasma conditions thereby inhibiting change in surface crystal structure;

thinning the n^+ substrate material to a desired thickness for the device;

producing a photolithographic mask on the surface of the n^+ substrate material;

depositing by sputtering, on both the p^+ and n^+ surfaces a succession of layers of titanium, 800–1200Å, platinum 1,600–2,400Å, and gold, 8000–12,000Å, and electroplating gold layers over these sputtered gold layers;

removing the photolithographic mask to expose the surface of the n^+ substrate material around a series of gold pads;

by high energy proton bombardment, passivating the zones of semiconductor material in depth through the slice to create zones of semi-insulating material to isolate the semiconductor material directly below the gold pads, the energy of protons being increased in stages at intervals of less than 0.11MeV up to an energy in MeV approximately equal to one-tenth of the required passivated layer thickness in μm using a proton dose at each stage of from 10^{14} to $5 \times 10^{15}cm^{-2}$ and a rate of from $2 \times 10^{12}sec^{-1}$ to $5 \times 10^{12}sec^{-1}$ using a proton scan raster pattern ensuring uniformity of dose over the area of the device; and

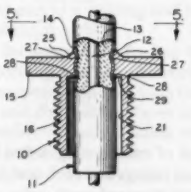
mounting the processed semiconductor material on to a heat sink and connecting one or more of said gold pads to a connection block.

4,099,319

METHOD OF ASSEMBLY OF ELECTRIC HEATING ELEMENT WITH BULKHEAD FITTING

Alan D. Vogel, Laurel, Md., assignor to Electro-Therm, Inc., Laurel, Md.

Division of Ser. No. 564,938, Apr. 3, 1975, Pat. No. 4,035,609. This application May 26, 1977, Ser. No. 800,886
Int. Cl.² H05B *3/00*
U.S. Cl. 29—611 **2 Claims**



1. A method of securing a fitting to a sheathed electrical conductor, the fitting being of the type which sealably passes the conductor through an aperture in a bulkhead, and includes

a flange portion having a diameter greater than the bulkhead aperture,

a sleeve portion integrally adjacent and concentric with said flange portion having an outer diameter smaller than the bulkhead aperture and a length greater than the thickness of the bulkhead, and a threaded portion for receiving a fastener for drawing said flange portion into engagement with the bulkhead,

said flange and sleeve portions including an axially-extending aperture dimensioned to slidably receive in surface contact the sheath of the conductor, and a lip on the face of said flange portion adjacent to said axially-extending aperture,

said method including the steps of:

inserting the sheathed electrical conductor through the axially-extending aperture so as to bring the sheath into surface-contact with the wall of the axially-extending aperture; and

axially compressing the lip into the face of the flange portion

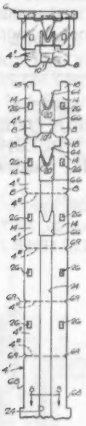
so as to force the wall of the axially-extending aperture and the sheath to be radially deformed whereby a mechanically-rigid liquid-sealing engagement is established between the fitting and the sheath.

4,099,320

METHOD OF MAKING A MINIATURE PLUG-IN FUSE

John Schmidt, Jr., Mount Prospect, and Avinash Aryamane, Elk Grove, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 698,079, Jun. 21, 1976, Pat. No. 4,023,264. This application Apr. 25, 1977, Ser. No. 790,657
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.[2] H01H *69/02*
U.S. Cl. 29—623 13 Claims



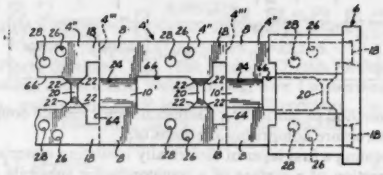
1. A method of making plug-in fuse elements having different desired fuse ratings and each comprising a plug-in element including a pair of spaced confronting generally parallel terminal blade portions to be received by pressure clip terminals or the like, a pair of confronting current-carrying extensions projecting longitudinally from the inner ends of the pair of terminal blade portions and a fuse link portion interconnecting the current-carrying extensions, said method comprising the steps of providing substantially identical blank portions of fuse metal for forming fuse elements of different fuse ratings which blank portions are initially provided with portions of substantially identical reduced thickness and substantially identical width for plug-in fuse elements of different fuse ratings, blanking at least said portions of reduced thickness of each blank portion to leave a pair of spaced confronting general parallel terminal blade portions to be received by pressure clip terminals of the like and confronting current-carrying extensions projecting longitudinally from the inner end portions of each pair of terminal blade portions, the fuse elements of different ratings being obtained by blanking said longitudinally extending portions of reduced thickness to provide fuse-forming links of substantially different locations between the confronting portions of said current-carrying extensions where the heat dissipation characteristics thereof are substantially different.

4,099,321

METHOD OF MAKING A MINIATURE PLUG-IN FUSE

Avinash P. Aryamane, Elk Grove, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 692,040, Jun. 2, 1976, Pat. No. 4,023,265, which is a continuation of Ser. No. 640,253, Dec. 12, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,395
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.[2] H01H *69/02*
U.S. Cl. 29—623 12 Claims



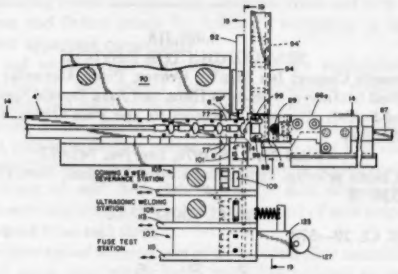
1. A method of making a plug-in fuse element comprising a plate-like body of the fuse metal having a pair of terminal blade portions to be received by pressure clip terminals in a mounting panel, current-carrying extensions at the inner end portions of the pair of terminal blade portions and a fuse link portion interconnecting the current-carrying extensions, said method comprising the steps of providing a blank of fuse metal which is initially provided between opposite margins thereof with a continuous band of reduced thickness, blanking said blank of fuse metal including at least said portion of reduced thickness to leave a pair of juxtaposed, spaced, terminal forming blade portions outside of said portion of reduced thickness, said fuse link portion formed in said portion of reduced thickness and said current-carrying extension of said terminal blade portions interconnected by said fuse link portion.

4,099,322

METHOD FOR MAKING PLUG-IN FUSE ASSEMBLIES

Robert J. Tait, Arlington Heights, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Feb. 7, 1977, Ser. No. 766,239
Int. Cl.[2] H01H *69/02*
U.S. Cl. 29—623 2 Claims



1. A method of mass producing plug-in fuse assemblies each including a plug-in fuse element comprising a plate-like body of fuse metal having a pair of spaced confronting generally parallel terminal blade portions to be received by pressure clip terminals or the like, current-carrying extensions at the inner ends of said pair of terminal blade portions and a fuse link portion interconnecting the current-carrying extensions, and an insulating unit rigidly extending between said current-carrying extensions, said method comprising the steps of providing a strip of fuse metal having longitudinally spaced blank portions from which individual plug-in fuse elements are to be formed, sequentially advancing the strip of fuse metal past

punch and die assemblies which form in each blank portion of the strip said pair of terminal blade portions and current-carrying extensions interconnected by said fuse link portion; providing a punch assembly including a punch unit and backing means therefor, said punch and backing means having a width no greater than the length of said terminal blade portions; positioning the terminal blade portions of the end blank portion of the strip between said punch and backing means; moving the punch against the terminal blade portions of the end blank portion of the strip to sever the same from the strip and to bring the severed blank against the backing means where it is clamped securely between the punch and the backing means; and providing an insulating unit with an entry opening at one end adapted to receive the current-carrying extensions and fuse link portion of the severed end blank and pushing said insulating unit over the current-carrying extensions of the end blank clamped between said punch and said backing means.

4,099,323

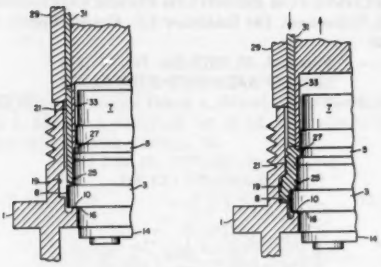
METHOD OF MAKING ELECTRICAL CONNECTOR

Alfred Joseph Bouvier, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 657,124, Feb. 11, 1976, Pat. No. 4,019,799. This application Dec. 17, 1976, Ser. No. 751,931

Int. Cl.² H01R *43/04*

U.S. Cl. 29—629 **7 Claims**



1. The method of assembling a connector having a shell and an insert member and wafer with appertures therein for receiving electrical terminals, comprising assembling the insert member and wafer member, wrapping a deformable laminate around the members, inserting the assembled members and laminate into the shell with the insert member abutting a shoulder on the inner face of the shell, inserting a first sleeve into the shell in engagement with the laminate, applying force to the first sleeve to deform the laminate in a space between the shell and members, maintaining a second sleeve within the first sleeve in engagement with a shoulder on the wafer member to maintain the members in assembled position with the insert member abutting the shoulder in the shell while applying force to the first sleeve to deform the laminate, and removing the first and second sleeves from the shell including the assembled members.

4,099,324

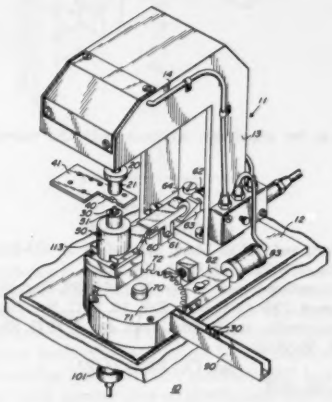
MECHANISM FOR FEEDING AND INSERTING PINS INTO CIRCUIT BOARD

David Leroy Johnson, Des Plaines, and Chester Joseph Matusek, Hillside, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 21, 1977, Ser. No. 779,454

Int. Cl.² B23P *19/00*

U.S. Cl. 29—739 **8 Claims**



1. A sequential magazine feed and holding apparatus for pins comprising:

a collet means having a longitudinal bore extending therethrough from a feed end to a holding end for receiving, transporting and holding a pin;

magazine feed means for sequentially feeding the pin into a position near the receiving end of said collet means bore;

transport means for transporting the pin from the feed end to the holding end of said collet means bore; and

holding means for predeterminedly holding the pin in the holding end of said collet means bore.

4,099,325

MACHINES FOR INSERTING ELECTRIC CIRCUIT COMPONENTS ON PRINTED CIRCUIT BOARDS

Howard Burgess Baker, Coventry, England, assignor to The General Electric Company Limited, London, England

Filed Feb. 9, 1977, Ser. No. 767,056

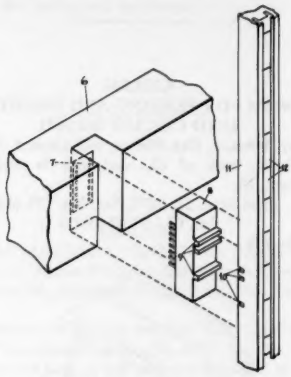
Claims priority, application United Kingdom, Feb. 10, 1976, 5104/76

Int. Cl.² H05K *3/30*

U.S. Cl. 29—741 **5 Claims**

1. A machine for inserting in a respective position on a printed circuit board any one of a plurality of different electric circuit components taken as required from respective holding locations in the machine comprising control means and, at one of said holding locations first means which is electrically connected to said control means to present to said control means electrical characteristics identifying a respective circuit component and which first means has an external shape at least part of which also identifies said respective circuit component, and

second means which is arranged to hold a plurality of said respective circuit components and at least part of which is



shaped to be attachable adjacent only the respective first means.

4,099,326

GARDEN SHEARS

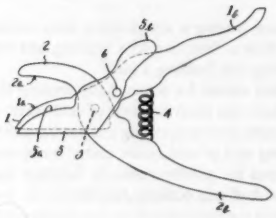
Eizo Mori, and Takao Mori, both of 11 of 473-banchi, Oaza Kuzuha, Hirakata-shi, Osaka-fu, Japan

Continuation-in-part of Ser. No. 645,659, Dec. 31, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,194

Claims priority, application Japan, Jan. 7, 1975, 50-4735; Apr. 30, 1975, 50-53022

Int. Cl.² B26B *13/22*

U.S. Cl. 30—135 **3 Claims**



1. A pair of garden shears comprising a pair of elongated shear elements having complementary cutting portions at the forward end of each and having gripping means for actuating the shear elements at the opposite ends thereof, first pivot means spaced rearwardly of said cutting portions connecting said shear elements to one another in pivotal relationship for opening and closing the cutting portions of the shear elements, spring means spaced rearwardly of said pivot means connecting the shear elements to one another under compression to keep the cutting portions of the shear elements in a normal open state, branch retaining means of a length materially less than the length of each of said shear elements, second pivot means pivotally securing said branch retaining means to one of said shear elements, said second pivot means being positioned rearwardly of and in off-setting relationship to the first pivot means of the shear elements, said branch retaining means having a branch engaging portion at the forward end thereof and lying in superposed relationship with the cutting portion of the shear element to which the branch retaining means is pivoted, said branch portion being in aligned operating relationship with the cutting portion of the shear element, the opposite end of the branch retaining means having an operating portion located forward of the gripping means of each of said shear elements to insure the retention of a branch by the shears after a branch has been cut.

4,099,327

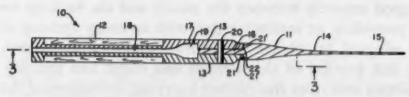
FOLDING KNIFE

William A. Pesa, 578 Oakley Rd., Wooster, Ohio 44691

Filed Aug. 17, 1977, Ser. No. 825,292

Int. Cl.² B26B *1/02*

U.S. Cl. 30—161 **13 Claims**



9. A knife adapted to be folded comprising the combination of a blade sandwiched between a pair of bolsters which are connected to a handle and a pivot pin extending between the bolsters and through an end of the blade, the improvement wherein the forward edge of each said bolster has a surface of an arcuate configuration and the confronting rearward end of the blade has a surface of an arcuate configuration substantially similar to that of the bolsters to permit the blade and bolsters to meet in sliding engagement when the blade is in an opened or closed position thereby transferring any lateral forces acting on the blade to the bolsters and putting a shear stress on the pivot pin instead of forcing the bolsters apart.

4,099,328

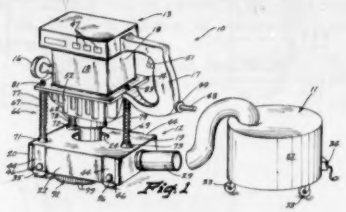
MACHINE FOR REMOVING FLOOR COVERING

John E. Schlemmer, 104 Southview Dr., Grundy Center, Iowa 50638

Filed Jul. 20, 1977, Ser. No. 817,208

Int. Cl.² A47L *11/02*; B24B *55/06*

U.S. Cl. 30—172 **10 Claims**



1. A machine for shredding and removing covering material from a floor surface, comprising:

(a) a portable base structure including an open bottomed shredding chamber having a discharge opening,

(b) an upper frame structure,

(c) means for adjustably supporting the upper frame on the portable base structure, said support means being adjustable to vary both the height and inclination of the upper frame relative to the portable base structure,

(d) wire brush means, rotatable within the shredding chamber having a working surface adjacent the floor surface for engaging and shredding covering material on the floor surface,

(e) means for supporting said wire brush means on the upper frame for rotation about an upright axis inclined relative to the floor surface, and

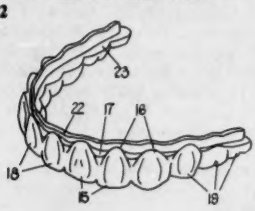
(f) a motor supported on said upper frame and connected in a drive relation with said wire brush means, whereby material shredded by the rotating brush means is orbited within the shredding chamber toward the discharge opening.

4,099,329

ARCH FORMS AND A METHOD OF MOULDING SAME

Horace Stanley Hawthorne, West Midlands, England, assignor to Lucas Electrical Limited, Birmingham, England

Filed Apr. 21, 1976, Ser. No. 679,071
Int. Cl.[2] A61C *19/00*
U.S. Cl. 32—2 9 Claims



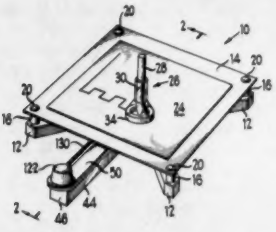
1. An arch form comprising a tooth portion including a plurality of integral teeth of a first plastics material, each tooth having a base portion, an integral fillet between said base portions at each pair of adjacent teeth, at least one integral projection provided on said tooth portion, and a gum portion of a second plastics material, said second plastics material being of a different color than said first plastics material, and said gum portion surrounding said at least one projection and meeting said tooth portion at least at said fillet.

4,099,330

VIBRATORY DRAWING DEVICE

Alan A. Hicks, Chicago; Derek A. Brand, Naperville, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 14, 1977, Ser. No. 767,398
Int. Cl.[2] B43L *13/00*
U.S. Cl. 33—18 R 13 Claims



1. An apparatus for creating designs on a substrate, comprising, in combination:

a frame structure;

a platen movably mounted on a frame for supporting a substrate;

means for moving said platen relative to the frame structure in a first direction at a predetermined rate and in an opposite direction in a substantially greater relative rate; and

a marking device of predetermined mass positionable on said platen and engageable with said substrate for movement therewith at said predetermined rate and for movement relative thereto in response to movement of the platen at said greater relative rate for creating designs on the substrate by movement of said marking device over the substrate.

4,099,331

PLUMB-RULE

Wallace W. Peterson, 8243 Highway B, Kewaskum, Wis. 53040, and Oscar L. Anderson, 2919 S. 71st St., Milwaukee, Wis. 53219

Filed May 17, 1976, Ser. No. 687,296
Int. Cl.[2] G01C *9/00*
U.S. Cl. 33—88 7 Claims

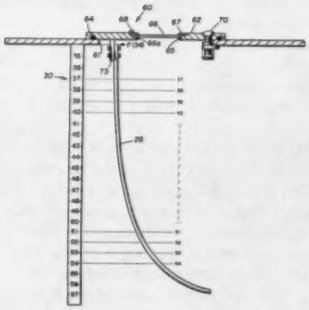
1. A plumb-rule comprising a pair of inner and outer channel members telescopically related in face to face arrangement with the back of the inner channel member closing the open side of said outer channel member, said members having their adjacent sides interlocked to prevent lateral displacement of said inner member from said outer member, spirit level means within said outer member free of interference with the inner member, a bracket secured to said outer member and carrying said spirit level means, and window means in the face of said outer member registering with said spirit level means for ready observance thereof the outer end of the inner channel member having means aligned with a surface of said outer member for determining the position of the plumb rule in accordance with the indication of said spirit level means.

4,099,332

ULLAGE GAGE

John P. Jones, Jr., Greenwich, Conn., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,928
Int. Cl.[2] G01F *23/00*
U.S. Cl. 33—126.7 R 12 Claims



1. A gage for measuring the ullage of a cargo tank located below the deck of a vessel, said gage comprising:

a sword affixed to the underside of said deck and extending downward into said cargo tank, said sword having a plurality of spaced calibration marks thereon, each of said marks indicative of a discrete vertical distance below the underside of the deck; and

a viewport through said deck adjacent said sword for viewing said plurality of said spaced calibration marks on said sword from said deck, said sword being curved so that the lower portion of said sword will underlie said viewport.

4,099,333

WHEEL ALIGNMENT TESTING APPARATUS

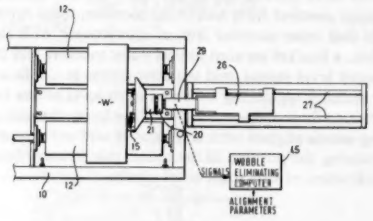
Brian Michael Forster, Harthill, England, assignor to GKN Transmissions Limited, Erdington, England

Filed Jan. 6, 1976, Ser. No. 646,754

Claims priority, application United Kingdom, Jan. 7, 1975, 537/75; Sep. 20, 1975, 38698/75

Int. Cl.[2] G01B 5/24

U.S. Cl. 33—203.12 **7 Claims**



1. Apparatus for testing the alignment of road wheels of a vehicle comprising:

(a) a frame;

(b) two pairs of spaced parallel rollers mounted on said frame for supporting two wheels of a vehicle to be tested;

(c) motor means for rotating said rollers for effecting rotation of said wheels;

(d) reference surface means for securement to each wheel to be tested;

(e) first sensing means for sensing the attitude of said reference means, said first sensing means including a first pair of vertically spaced transducers in operative contact with said reference surface and actuated thereby, each of said transducers continuously producing an electrical signal including a first, DC component representative of at least one wheel alignment parameter and a second, AC component representative of the instantaneous wobble of the reference surface means during rotation of said wheel, and

(f) electric circuit means connected to and receiving the signals from said pair of transducers, said electric circuit means acting on said signals to separate said second components therefrom and to produce an output signal representing the difference between said first components in the signals from said transducers, said output signal being representative of a wheel alignment parameter.

4,099,334

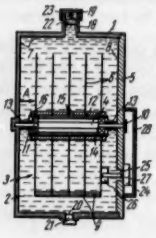
DIP ANGLE DATA TRANSMITTER

Eduard Nikolaevich Kuzin, ulitsa 3 Internatsionala, 74, kv. 199; Mikhail Leibovich Fainzilber, Budapeshtskaya ulitsa, 17, korpus 5, kv. 62; Nadezhda Borisovna Ivanova, ulitsa Dimitrova, 10, korpus 1, kv. 220; Jury Stepanovich Kozlov, ulitsa Dimitrova, 10, korpus 1, kv. 160; Vladimir Fedorovich Korelin, ulitsa Belgradskaya, 20, kv. 123; Nikolai Vasilievich Dmitrievsky, Piskarevsky prospekt, 10, kv. 289, all of Leningrad; Savaty Solomonovich Schedrovitsky, 13 Parkovaya ulitsa, 25, korpus 1, kv. 12, Moscow; Vitaly Iosifovich Berkman, ulitsa Shvernika, 12/2, korpus 2, kv. 57, Moscow, and Anatoly Borisovich Syrkov, Pogonny proezd, 25, kv. 62, Moscow, all of U.S.S.R.

Filed Feb. 17, 1976, Ser. No. 658,715

Int. Cl.[2] G01C 9/08, 9/06, 9/12

U.S. Cl. 33—346 **4 Claims**



3. A dip angle measuring device, comprising:

a casing having an inner surface;

viscous fluid completely filling said casing and serving as a first body of inertia of the device;

a laminated pendulum provided in the form of separate substantially parallel, spaced part sector-shaped plates rotatably mounted on a shaft for rotation about a common axis, said pendulum being arranged in said viscous fluid, and said shaft of said pendulum being disposed in said casing; said pendulum being damped primarily by forces of viscous friction acting on said plates, the spacing of said plates and the viscosity of said fluid being such that said forces are proportional to the speed of the pendulum rotation relative to said first body of inertia;

a converter of the angle of rotation of said pendulum relative to said casing into a physical value useful for providing an indication of the dip angle, said converter being carried by said pendulum and said casing; and

means arranged in said casing for making up for thermal expansion of said viscous fluid within an anticipated working range of temperatures for said transmitter; and

a second body of inertia in the form of discs carred by said shaft of said pendulum between the plates thereof and arranged parallel to said plates.

4,099,335

DRYING AND FINISHING OPERATIONS IN SLURRY OR BULK PHASE POLYMERIZATION PROCESSES

James L. Jezl, St. Charles, and Edwin F. Peters, Winfield, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 19, 1976, Ser. No. 743,095

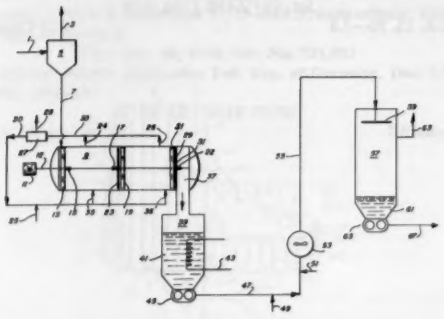
Int. Cl.[2] F26B 3/00

U.S. Cl. 34—9 **17 Claims**

1. A process for drying polymer slurry containing active polymerization catalyst and produced by polymerization in a slurry or bulk phase polymerization which comprises

(a) adding said slurry to a stirred drying zone containing solid particulate polymer, wherein the amount of slurry added is small in comparison with the amount of said solid particulate polymer;

(b) passing a gas stream containing polymerizable monomer into said drying zone;
(c) carrying out a fraction of the overall amount of polymerization in said drying zone, thereby vaporizing easily va-



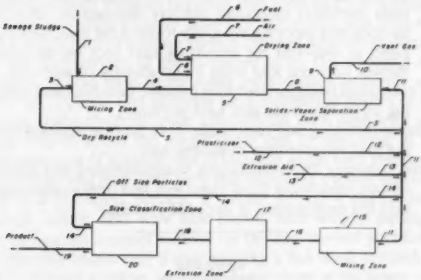
porizable components in the polymer slurry, in essential part, by polymerization heat; and
(d) removing said vaporized components from said drying zone in said gas stream.

4,099,336

ORGANIC WASTE DRYING PROCESS

Vere Maffet, West Chester, Pa., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 775,673, Mar. 8, 1977. This application Jul. 7, 1977, Ser. No. 813,578
Int. Cl.[2] F26B 7/00
U.S. Cl. 34—12 **11 Claims**



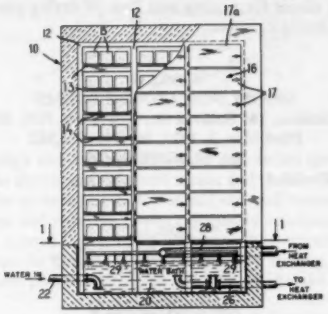
1. A process for drying organic waste which comprises the steps of :
(a) passing a feed stream comprising water and organic waste into a drying zone operated at drying conditions and effecting the evaporation of water contained in the feed stream, and the production of a drying zone effluent stream comprising particulate organic waste and water vapor;
(b) separating the drying zone effluent stream in a solids-vapor separating zone and producing a vapor stream comprising water vapor and a dry solids stream comprising particulate organic waste and containing less than about 15 wt.% water;
(c) admixing a plasticizer into at least a first portion of the dry solids stream, with the amount of plasticizer which is added being less than 5 wt.% of the first portion of the dry solids stream; and,
(d) extruding the first portion of the dry solids stream in an extrusion zone under conditions sufficient to cause at least partial plasticization of the dry solids and the formation of a product stream having a bulk density within the range of about 30–65 lb/ft^3.

4,099,337

METHOD OF CURING CONCRETE ARTICLES BY WATER VAPORIZATION

Billy Joe Wauhop, Jr., 717 Forth St., Belvidere, N.J. 07823

Filed Dec. 13, 1976, Ser. No. 749,754
Int. Cl.[2] F26B 3/00
U.S. Cl. 34—26 **9 Claims**



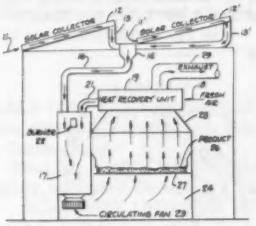
1. A method of curing concrete articles in a kiln, comprising the steps of: forming a water bath at the base of the kiln beneath the lowermost level of the concrete articles to be cured; heating and maintaining the water bath at a sufficient temperature, below its boiling point, and spraying the heated water into the water bath at a level beneath the lowermost level of the concrete articles so as to promote and effect vaporization of the water to obtain throughout the kiln a substantially uniform curing atmosphere having sufficient heat and moisture to hydrate and harden the cement to thereby cure the concrete articles; and replenishing the water, as needed, to maintain the water bath throughout the curing.

4,099,338

SOLAR ASSISTED DRYER APPARATUS AND METHOD

Joseph V. Mullin, Cherry Hill, N.J., and W. Edwin Sauer, Douglasville, Pa., assignors to Proctor & Schwartz, Inc., Philadelphia, Pa.

Filed Nov. 10, 1976, Ser. No. 740,619
Int. Cl.[2] F26B 3/04
U.S. Cl. 34—35 **7 Claims**



1. A dryer apparatus unit comprising:
a primary heater for heating gases;
a drying chamber comprising an inlet for a flow of drying gas, and inlet and outlet means for material to be dried;
means communicating the primary heater with the drying chamber inlet;
an exhaust line for withdrawing spent gas from said drying chamber;

solar warming means for a fresh flow of diluent gas, said solar warming means being adapted for large, low velocity gas flow and imparting small temperature rise of the gas flow therethrough;

a heat exchanger disposed in said exhaust line for warming diluent gas from another source other than the solar warming means by heat exchange with said spent gas;

ducting means directing said fresh flow of diluent gas and the diluent gas from another source into further heating relationship which said primary heater for forming said flow of drying gas; and

driving means for passing said flow of drying gas through said drying chamber.

4,099,339

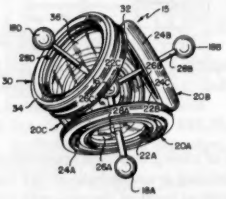
MODEL FOR ATOMIC FORMS

Kenneth Snelson, 140 Sullivan St., New York, N.Y. 10012

Filed Mar. 2, 1977, Ser. No. 773,552

Int. Cl.[2] G09B *23/26*

U.S. Cl. 35—18 A **8 Claims**



1. A model for atomic comprising:

(a) a plurality of pairs of ring magnets, each of the ring magnets defining an axis perpendicular to the plane of the ring and passing through its center and having a magnetic field approximately axially symmetric about said axis, each pair of magnets having a first ring magnet and a second ring magnet for representing a pair of electrons, the second ring magnet of each pair being detachably magnetically supportable by the first ring magnet with the axes of said first and second ring magnets in substantial coaxial alignment; and

(b) means for supporting the first ring magnets at predetermined positions and orientations with their axes passing through a spherical volume having a diameter substantially smaller than the diameters of the first ring magnets.

4,099,340

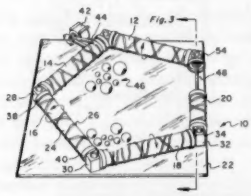
CHAOTIC MOTION GENERATOR

Crispin O. Butler, 106 Kendall Blvd., Oaklyn, N.J. 08107

Filed Jun. 8, 1977, Ser. No. 804,585

Int. Cl.[2] G09B *23/06*

U.S. Cl. 35—19 R **10 Claims**



1. A chaotic motion generator comprising a substantially horizontal surface, elongated roller means mounted on said surface so as to be spaced therefrom, said roller means lying in a substantially horizontal plane substantially parallel to said surface and defining a substantially closed loop, and means for rotating said roller means.

4,099,341

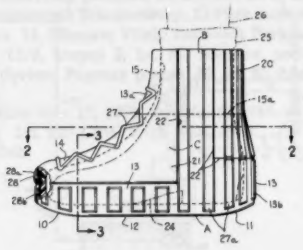
FOOT WARMER

Larry R. Gibson, Rte. 6, Box 652, Easley, S.C. 29640

Continuation-in-part of Ser. No. 648,115, Jan. 12, 1976, abandoned. This application Sep. 23, 1976, Ser. No. 725,691

Int. Cl.[2] A43B *1/10, 5/04*

U.S. Cl. 36—7.3 **7 Claims**



1. A foot warmer constructed essentially of a stiff waterproof insulating synthetic foam material for receiving a wearer's shoe, boot and the like, comprising:

a unitary sole having a toe portion tapering inwardly toward the front and a heel portion tapering inwardly toward the rear;

vertically extending marginal sides integral with said sole;

an instep and toe cover bridging said sides adjacent a front portion thereof extending across said toe portion;

said sides and cover defining an opening at a top portion snugly receiving a leg of the wearer therein;

said sides including longitudinal intermediate members tapering inwardly toward the rear;

a removable front panel including said instep and toe cover extending transversely of said sole bridging said intermediate members extending entirely thereacross providing an open end tapering inwardly toward the rear, when said panel is removed for admitting said foot by movement thereof between said sides longitudinally of said sole;

a rear panel bridging said intermediate members and extending upwardly from said heel portion;

means fastening said removable front panel in position bridging said intermediate members; and

said fastening means including complimentary end portions on said removable front panel and said intermediate members for engagement is opposed relation.

4,099,342

FOOTWEAR

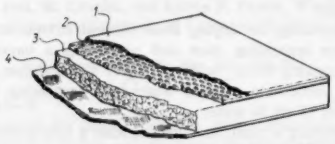
Tej Kuldip Singh, Baildon, England, assignor to Associated Paper Industries Limited, London, England

Filed Jul. 19, 1977, Ser. No. 817,072

Claims priority, application United Kingdom, Jul. 31, 1976, 32010/76

Int. Cl.[2] A43B *13/38, 23/00;* B32B *5/16*

U.S. Cl. 36—44 **5 Claims**



1. An air-permeable insole comprising a web or matt of fibres loaded with active carbon and held together by a binder disposed predominently at or near the surfaces of the web or matt, and at least one surface of said web or matt having a wear-resistant fabric bonded thereto by means of a discontinu-

ous layer of binder extending from the surface of each of the wear-resistant fabrics into the surface of the web or matt.

4,099,343

SPINNER

Ludwig A. Enz, Kreuzstrasse 17, D-6983 Kreuzwertheim, Fed. Rep. of Germany

Filed Dec. 20, 1976, Ser. No. 751,982

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558439

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.19 **2 Claims**

1. A fishing spinner comprising a centrally disposed wire axis including a loop at its upper end, and S-shaped narrow strip curved about its broad side and having boresthrough the middle and opposite end portions thereof, said wire axis passing freely through the bores in said middle and opposite end portions, a bead element between said loop and the S-shaped strip and including a center bore through which said wire axis passes and a curved bearing surface thereon adapted to engage the top end portion of the S-shaped strip, the opposite end portions of said strip terminating immediately adjacent said wire, the opposite end portions for a substantial length of the S-shape inwardly from their intersection with said wire axis being twisted about the longitudinal axis of said strip in the same direction of rotation and at an acute angle with respect of the plane of said strip, said wire axis including a lower end bent back in a U-shaped portion, a weight having a central bore through which said wire axis passes, said weight having a curved bearing contact surface on the top thereof positioned immediately below said S-shaped strip, a fish hook secured on said U-shaped portion, and the central bore at its lower end being enlarged and receiving said U-shaped portion to retain said fish hook thereon.

4,099,344

SHADING UNIT FOR PLANT PROPAGATION

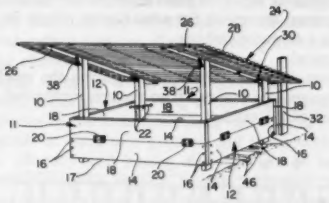
Robert F. Ruemeli, 1411 N. Westshore Blvd. (114), Tampa, Fla. 33607

Filed Oct. 9, 1975, Ser. No. 621,138

Int. Cl.[2] A01G *13/00*

U.S. Cl. 47—26 **8 Claims**

1. A non-greenhouse type plant propagation unit for shading a garden bed, said unit including means for providing an environment generally cooler than the surrounding ambient conditions to facilitate the growth of plants during hot weather which plants such as lettuce for example, generally require a cooler environment; said means comprising a continuous substantially solid side wall means extending entirely around said bed and substantially to the tops of mature plants growing therein and a perforate, removably mounted top means formed on non-transparent materail extending across and vertically spaced above said side wall means for protecting the plants therein from intense sunlight and beating rain, said unit retaining a body of relatively cool air, with respect to the ambient atmospheric conditions, around the enclosed plants; support means extending below and supporting said side wall means and defining a gap beneath the bottom of said side wall means and the bottom of said support means to permit passage of air



therethrough and drainage of water; post means spacing said top means above said side wall means and thereby defining a passage for air between the top of said side wall means and said top means; and securing means releaseably retaining said top means in normal operative position extending across said side wall means for covering the bed, whereby air may circulate freely about plants due to said gap and said passage.

4,099,345

PRODUCTION OF TURF

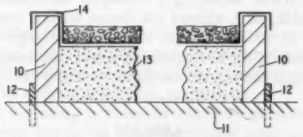
Frederic Walter Loads, Brookhouse, Near Lancaster, England, assignor to Kapag Manufacturing Co. Limited, Devon, England

Filed Nov. 8, 1976, Ser. No. 739,995

Claims priority, application United Kingdom, Nov. 11, 1975, 46475/75; May 15, 1976, 20175/76

Int. Cl.[2] A01G *1/00*

U.S. Cl. 47—56 **8 Claims**



1. A method of producing turf comprising establishing a layer of growing medium including grass seed on a water-impervious bed between parallel kerbs and, when predetermined growth has taken place, removing the layer from between the kerbs, said growing medium comprising lignite together with a particulate filler and a binding agent comprising pulverised paper pulp.

4,099,346

ADJUSTABLY LOUVERED ROOF PLATE ASSEMBLY

Nobujiro Isono, Sando, Japan, assignor to Shin Nippon Kinzoku Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1976, Ser. No. 748,042

Claims priority, application Japan, Jul. 27, 1976, 51-99947[U]

Int. Cl.[2] E05F *17/00*; E06B *7/096*

U.S. Cl. 49—82 **6 Claims**

1. A louver-type roof assembly, comprising:

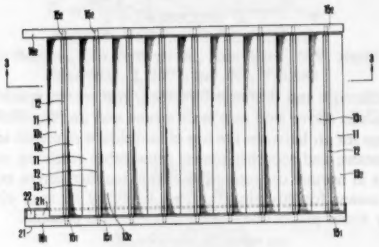
a plurality of elongated roof plates arranged side-by-side and each having shaft means extending from each end thereof;

a pair of frames, each with a series of openings for receiving the respective shaft means of said roof plates,

means retaining the shafts in the respective openings for rotation in a sense to open and close the roof;

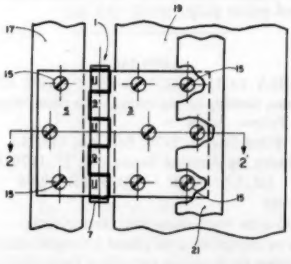
a crank secured on each said shaft at a respective one end of each roof plate;

connecting rod means extending along one of said frames;
each crank being pivotally connected to the connecting rod means;
a ratchet gear;
means journalling the ratchet gear for rotation on said one frame;
a drive pawl;
means mounting the drive pawl adjacent the ratchet gear for engagement therewith for actuation to rotate the ratchet gear in a stepwise fashion;
a check pawl;
means mounting the check pawl adjacent the ratchet gear for engagement therewith to prevent undesired counter rotation of the ratchet gear;



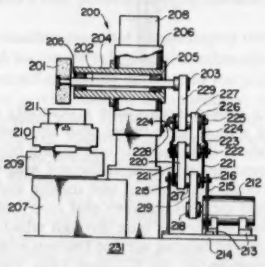
a crank shaft pivotally interconnecting the ratchet gear and the connecting rod means so that each time the drive pawl is actuated to rotate the ratchet gear one step further, the crank shaft moves the connecting rod means a corresponding step longitudinally, thus turning said cranks one step further and correspondingly rotating the roof plates one step further;
one of said frames including upwardly open channel means arranged to catch rainwater draining along the roof plates, as a gutter, and opening means therein to provide a downspout therefor;
said one frame including a C-shaped sub-frame having an open side, an L-shaped sub-frame with a vertical flange and a horizontal flange; the vertical flange closing the open side of the C-shaped sub-frame and extending thereunder and the horizontal flange forming said gutter.

4,099,347
DOOR HINGES
Dennis J. Sharp, 1254 Church St., Reading, Pa. 19601
Filed Dec. 9, 1975, Ser. No. 639,129
Int. Cl.² E05D *3/02*
U.S. Cl. 49—399 **3 Claims**



1. A door, including a door frame, a door, a jamb, and a pair of cooperative hinge plates held together for rotation with respect to each other around a central hinge pin with one of the cooperative hinge plates mounted on the door frame and the other of the pair of hinge plates mounted on the door, characterized in that the hinge plate adapted to be mounted on the door frame extends radially a greater distance from the axis of rotation of the hinge pin than does the hinge plate adapted to be mounted on the door, and in that the doorjamb is mounted over at least a portion of the greater distance of the hinge plate mounted on the door frame.

4,099,348
MACHINING ARRANGEMENT WITH MEANS TO ISOLATE VIBRATIONS FROM THE WORKING SPINDLE
Shigeo Kato, Mitaka; Sakae Saito, and Osamu Morita, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan
Filed May 27, 1977, Ser. No. 801,373
Claims priority, application Japan, May 28, 1976, 51-61164
Int. Cl.² B24B *41/02*
U.S. Cl. 51—92 R **32 Claims**

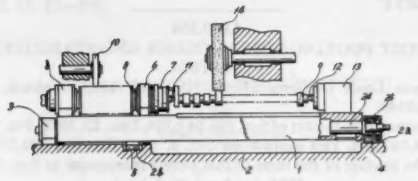


1. A workpiece machining arrangement comprising:
means for machining a workpiece,
a rotatable spindle means mounted at said machining means,
a tool mounted on said rotatable spindle means,
driving means for rotating said rotatable spindle means,
means for transmitting a driving power from said driving means to said rotatable spindle means including a flexible linkage comprising a plurality of interconnected link members, said link members including at least two laterally spaced arms with pulley means arranged at respective end portions of said arms, at least three belt means arranged in series between the pulley means, the driving means and the rotatable spindle means, said belt means being rotatably supported by said pulley means, a first of said at least three belt means being arranged between said driving means and a first of said pulley means, and only a last of said at least three belt means being arranged between one of said pulley means and said rotatable spindle means,
a base plate means for mounting said driving means, said base plate means being independent of and unattached to said machining means,
a fixed frame mounted on said base plate means,
a shaft mounted in said fixed frame,
wherein one end portion of said two arms is rotatably mounted at said shaft, and
wherein said driving means, said transmitting means and said machining means are arranged with respect to each other such that the rotatable spindle means is completely isolated from any vibrations generated by said driving means and said transmitting means.

4,099,349
CAM GRINDING MACHINE WITH SWING TABLE SUPPORT DEVICE

Hiroaki Asano, Chiryu, Japan, assignor to Toyoda Koki Kabushiki-Kaisha, Japan

Filed Oct. 21, 1977, Ser. No. 844,199
Claims priority, application Japan, Nov. 4, 1976, 51-147232[U]
Int. Cl.² B24B 5/42
U.S. Cl. 51—101 R 4 Claims

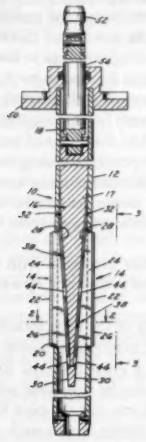


1. A cam grinding machine for grinding a cam shaft comprising:
- a traverse table;
- a swing table;
- first and second end support means mounted on a first surface of said traverse table for swingably supporting said swing table at opposite ends thereof;
- third intermediate support means arranged between said first and second end support means and mounted on a second surface of said traverse table, said second surface being lower than said first surface;
- a shaft rotatably supported by said third intermediate support means; and
- tightening means for fixing the opposite ends of said shaft into bores formed on inside walls of said swing table.

4,099,350
HONING ASSEMBLY

Jerry N. Hasty, Plymouth, Mich., assignor to MWA Company, Owosso, Mich.

Filed May 31, 1977, Ser. No. 802,266
Int. Cl.² B24B 33/08
U.S. Cl. 51—338 2 Claims

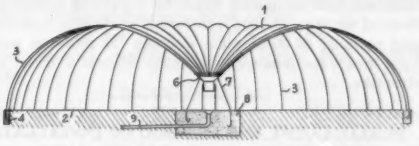


1. A honing assembly comprising an elongated hollow head provided with a plurality of circumferentially spaced slots, honing elements projecting from said slots, an elongated adjusting member for said honing elements longitudinally adjustably supported within said head, said adjusting member having elongated longitudinally tapered surface portions registering with said respective slots, longitudinally extending, continuous undercut grooves in said tapered surface portions of said adjusting member, and a pair of longitudinally spaced studs on each honing element, said studs being shaped to fit slidably in said undercut grooves so that longitudinal movement of said adjusting member relative to said head in one direction will cause radially inward movement of said honing elements, the radially inner surfaces of said honing elements engaging said tapered surface portions of said adjusting member to cause said honing elements to be cammed radially outwardly when said adjusting member is moved longitudinally in the opposite direction, each groove having a pair of openings spaced apart longitudinally the same distance as each pair of studs to permit said studs to enter said grooves and to be withdrawn therefrom, whereby said honing elements can be assembled and disassembled with respect to said adjusting member, said groove openings being located longitudinally in positions such that they will register with said studs only when the honing elements are retracted inwardly beyond a point where honing would normally be carried out.

4,099,351
INFLATABLE STRUCTURES

Pierre Dalo, 12 rue du Dr Kurzenne, Jouy-en-Josas, France (78350), and Jean Dalo, Rue Beaurepaire, Roinville sur Dourdan, France (91410)

Filed Dec. 6, 1976, Ser. No. 747,487
Claims priority, application France, Jan. 19, 1976, 76 01208; Jun. 9, 1976, 76 17322
Int. Cl.² E04B 1/34
U.S. Cl. 52—2 8 Claims



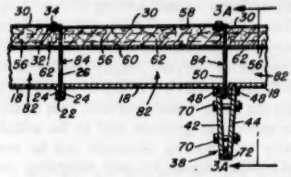
1. An inflatable and deflatable air supported structure which lies in a flat plane and has a rounded geometrical shape in its uninflated condition and which has a substantially spherical shape in its inflated condition, comprising:
- a wall including a sheet of rounded geometrical flexible material having an outer peripheral edge with a first perimeter which is greatest in its flat two-dimensional uninflated condition and having an inner central portion, said peripheral edge of the perimeter in the inflated three-dimensional condition of said sheet being substantially geometrically rounded in shape and forming a second outer perimeter which is less than the first perimeter of said sheet in its uninflated condition;
- a plurality of cables extending radially from said outer peripheral edge to said inner central portion and connected with said sheet, said cables dividing said sheet into gores which are formed between each pair of adjacent cables, said cables having outer ends extending beyond said outer peripheral edge and inner ends extending to said inner central portion;
- first anchoring means connecting said outer ends of said cables to the ground to anchor said sheet and the outer peripheral edge of said sheet to the ground; and,
- second anchoring means connected with said inner ends of said cables and said inner central portion to form an inner air-tight chamber with said flexible material in its inflated condition, said second anchoring means anchoring said inner central portion to the ground, and including
- a conical connecting element having one end connected with said inner ends of said cables, and tension members connected with the other end of said conical connecting element for connection thereof to the ground.

4,099,352

VAULTED STRUCTURE

William T. Clark, P.O. Box 885, Jackson, Miss. 39205

Filed Sep. 23, 1976, Ser. No. 725,934
Int. Cl.[2] E04B 1/32
U.S. Cl. 52—80 13 Claims



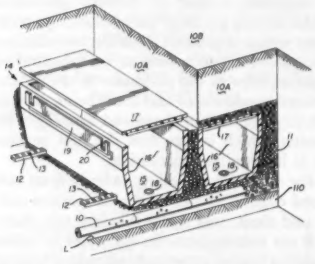
1. A vaulted structure having a base portion and an apex portion comprising a plurality of box-section modules means secured to form the structure, said box-section modules comprising adjacent spaced-apart exterior and interior skin gore members and at least a pair of spaced-apart generally radially extending flange members securing said gore members in spaced-apart relation and defining a ventilation void therebetween, at least some of said exterior gore members having outwardly turned edge portions, joint means for providing for expansion-contraction between at least some of said plurality of box-section modules, said joint means comprising at least a portion of one of said pair of spaced-apart radially extending flange members being interposed between and secured to said outwardly turned portions of two adjacent exterior gore members, and ventilation means for providing at least gravity flow of air through said ventilation void of at least some of said plurality of box-section modules for coaction with said joint means for minimizing thermal distortion of the vaulted structure.

4,099,353

BURIAL CRYPT AND METHOD OF INSTALLATION

Dan R. Blunt, 360 Glenview, Canfield, Ohio 44406

Filed Dec. 23, 1976, Ser. No. 754,018
Int. Cl.[2] E04H 13/00
U.S. Cl. 52—139 6 Claims



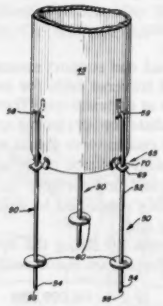
1. A burial crypt and means for positioning a plurality of the same in an excavation in inter-dependent relation to one another, said burial crypt being unitary and comprising a thin walled, lightweight, rectangular box having an open top and integral side, bottom and end walls and a cover registering with said open top, brackets on the upper sides of said burial crypt said brackets each including an elongate member attached to a corresponding side wall for a substantial length of that corresponding side wall at a location spaced from the top of that side wall, said elongate members each having a top edge spaced apart from the corresponding wall top edge, said elongate member having openings defined therein adjacent the top edge thereof, connecting members for engaging said bracket elongate members on adjacent burial crypts and joining the same to one another, said connecting members each including a bar member and an end member attached to each end of said bar, said bar members being received in bracket openings of said adjacent crypts with said end members each abutting a side wall of one of said adjacent crypts so that said side walls are connected by said connecting members in a manner which forms mutual reinforcing support of said joined side walls so as to enable said burial crypts to retain their desired position during a subsequent back-filling operation and support said back fill.

4,099,354

POST FOOTING FORM HOLDER AND STABILIZER SYSTEM

Mario Louis DePirro, 511 S. Highland Ave., Lombard, Ill. 60148

Continuation-in-part of Ser. No. 642,724, Dec. 22, 1975, Pat. No. 4,047,356. This application Oct. 6, 1976, Ser. No. 730,271
The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.
Int. Cl.[2] E04G 17/14
U.S. Cl. 52—146 22 Claims



1. A post footing form holder and stabilizer system for use in conjunction with a post form of the type having a lower open end, and stabilizer means for positioning and retaining the post form in its use position comprising in combination,

a plurality of legs having upper and lower ends, each of said legs provided with means for mounting said legs to the post form along the lower end thereof,

said means for mounting said legs to said post form comprising an offset portion formed in each of said legs adjacent the upper end thereof and adapted for penetrating said post form and a cross brace mounted on each of said legs in normal relation to said leg and positioned immediately below said offset portion thereby to prevent said offset portion from further penetrating into said post form,

post form carrying means associated with said legs for accommodating and carrying the post form along the lower end thereof,

said legs being further provided with stop means mounted thereon and spaced a distance upwardly from said lower end of said legs,

whereby a post form of the type terminating in a lower end which, in use, is positioned within an appropriate post hole to serve as a form for post footing material to be poured therein, may be provided with legs being mountable on the post form and the post form being carried by said post form carrying means such that said post footing form holder system may be positioned within a post hold to accommodate and permit the post footing material to be poured into the post form and exit below said lower end thereof to flow freely about said legs and form a lower post footing having a larger cross section than the cross section of the post form.

4,099,355

PANELING OF FIREPROOF INSULATING ELEMENTS FOR WALLS, FLOORS AND CEILINGS

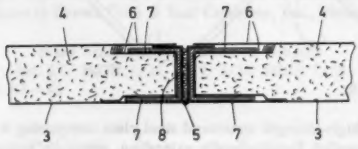
Ernst-Joachim Strunk, Weitefeld, Fed. Rep. of Germany, assignor to Horst Lampertz, Wallmenroth, Sieg, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,389

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630479

Int. Cl.[2] E04B *1/74*

U.S. Cl. 52—404 3 Claims



1. Paneling for walls, floors, and ceilings, comprising a plurality of panels in edgewise abutting relation, each panel comprising a metal casing with a filling of endothermally variable insulating material, the panels having, in the zone of their abutting edges, a double metal wall, insulating material within the double metal wall, and external insulating panels in edgewise abutting relationship with each other and overlying the first-mentioned panels, the butt joints between the external panels being offset with respect to the butt joints between the first-mentioned panels.

4,099,356

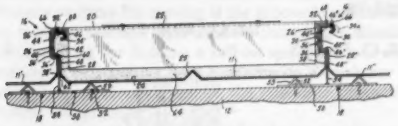
SEAMED RIB PANEL ASSEMBLY

Hubert P. Graham, Fort Mill, S.C., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Oct. 7, 1976, Ser. No. 730,158

Int. Cl.[2] E04D *1/30, 3/362*

U.S. Cl. 52—520 3 Claims



1. A panel assembly for buildings and the like comprising, in combination with structure for supporting the assembly,

(a) an array of elongated metal panels disposed in parallel side-by-side relation outwardly of said structure, each of said panels having first and second longitudinal flanges respectively projecting outwardly along opposite sides thereof, the first flange of each panel having an outer portion formed as a longitudinal box channel opening laterally away from the panel, the second flange of each panel having an outer portion formed as a longitudinal box channel fitted within and opening in the same direction as the channel of the first flange of the next adjacent panel in the array, the channel-formed portion of each flange having a flat outer leg with a free longitudinal margin formed with a return curve, and the return curve of the outer leg on each said first flange closely and conformably overlying the return curve of the outer leg of the adjacent-panel second flange fitted therein, the interfitted channel-formed portions of the first and second flanges of adjacent panels comprising a seamed rib for interlocking the panels, such that there is a seamed rib between each pair of adjacent panels in the array; and

(b) a plurality of metal anchor clips spaced along each said seamed rib for securing the array to said structure, each of said clips comprising a base mounted on the structure and an outward projection having an outer portion formed as a box channel conforming to, and interfitted nestingly between, the channel-formed portions of the interfitted first and second flanges constituting the seamed rib along which the clip is disposed;

(c) the channel-formed portion of the clip projection having a planar outer leg disposed between, but terminating short of the return curves of, the outer legs of the last-mentioned first and second flanges;

(d) the channel-formed portion of each flange having an inner leg parallel to the outer leg thereof, the channel-formed portion of each clip outward projection having an inner leg parallel to the outer leg thereof, and the channel-formed portions of the flanges and of the clip projection being mutually so dimensioned that the channel-formed portion of the second flange is snugly gripped between the legs of the clip projection and the channel-formed portion of the clip projection is snugly gripped between the legs of the first flange.

4,099,357

BUILDING PANELS, AND A BUILDING AND METHOD UTILIZING BUILDING PANELS

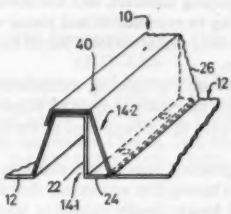
Allan Gerald Lester, 32 Curzon Ct., Klein St., Hillbrow, Johannesburg, Transvaal Province, South Africa

Filed Apr. 19, 1976, Ser. No. 677,984

Claims priority, application South Africa, May 1, 1975, 75/2818

Int. Cl.[2] E04D *1/00*

U.S. Cl. 52—533 9 Claims



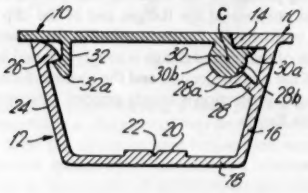
1. A panel assembly comprising at least two panels arranged in contiguous relationship, each of said panels having first and second opposed marginal ridges, the first marginal ridge being provided with an attachment zone whereby the panel is attached to a structure by at least one fastening means, and the second marginal ridge being of different cross-section but partly complementary to the first marginal ridge thereof and being adapted to be placed in overlapping relationship over the first marginal ridge of a contiguous panel to cover the attachment zone thereof, said contiguous panels forming a cavity between the respective second marginal ridges and the attachment zones and covering said fastening means, each of said overlapping first and second opposed marginal ridges having a pair of spaced flanks connected together by a substantially planar central strip, the first marginal ridge having innermost and outermost flanks diverging away from one another as they extend from the central strip, the central strips of contiguous panels overlapping each other adjacent one another and are fixed together by fastening means spaced from said structure, said fastening fixedly clamping said central strips together to secure said panels against relative movement.

4,099,358

INTERLOCKING PANEL SECTIONS

Pieter Compaan, Coaldale, Canada, assignor to Intercontinental Truck Body - Montana, Inc., Conrad, Mont.

Continuation-in-part of Ser. No. 640,096, Dec. 12, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,067
Claims priority, application Canada, Aug. 18, 1975, 233624
Int. Cl.[2] E04C 1/30, 2/40
U.S. Cl. 52—588 4 Claims



1. An interlocking construction panel adapted for interlocked engagement with other identical panels, said panel comprising:

a planar wall of elongate rectangular configuration,

one longitudinal edge of said wall having an integral open channel projecting downwardly therefrom with a bottom in parallel alignment therewith,

said open channel having an inwardly projecting longitudinal latch member adjacent the open top thereof on one side thereof,

the other side of said channel having first and second inwardly projecting members, said first inwardly projecting member being an extension of said planar wall and having upper and lower planar surfaces joined by a beveled edge at a fulcrum,

said second inwardly projecting member having a resilient inwardly and upwardly projecting finger-like configuration terminating in a trough-like, upwardly concave portion,

the other longitudinal edge of said planar wall remote from said channel having first and second downwardly projecting integral longitudinally extending interlock members, said first interlock member comprising a generally cylindrical bead-like member adapted to be received in said trough-like portion and a projecting lip having a planar top surface adapted to bear against said fulcrum, said planar top surface being connected to said planar wall along a beveled edge contacting said planar top surface at an apex,

said second interlock member having a configuration adapted for latching engagement with said latch member,

said fulcrum and the distal end of said concave portion being spaced apart a distance equal to the distance between said apex and the point of contact between said bead-like member and said distal end when two of said panels are interlocked, and less than the distance between said apex and all other points on said bead-like member contacted by said distal end as two adjacent panels are being brought into interlocking engagement,

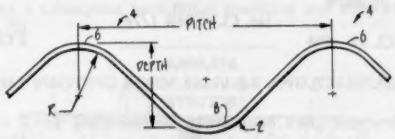
whereby said second inwardly projecting member is resiliently deformed during interlocking of two adjacent panels so that said bead-like member is clamped between said first and second inwardly projecting members when two of said panels are in interlocked engagement.

4,099,359

HIGH STRENGTH CORRUGATED METAL PLATE AND METHOD OF FABRICATING SAME

Eugene W. Sivachenko, 6851 Waverly, Redding, Calif. 96001

Filed Jun. 24, 1976, Ser. No. 699,289
Int. Cl.[2] E04C 2/32; E04D 1/00; E02D 5/00; F16L 9/00
U.S. Cl. 52—630 6 Claims



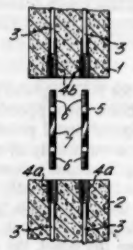
1. A high-strength structural steel plate comprising a plurality of parallel, longitudinally extending, generally sinusoidally shaped corrugations defined by altering convex and concave peaks and troughs, the spacing between adjacent peaks and troughs in a direction perpendicular to the plate being at least about 4 inches and the spacing between adjacent peaks in a direction parallel to the plate being at least about 12 inches, the plate having a thickness of no more than about one-half inch, the peaks and troughs having a curvature radius of at least about two inches, and a corrosion resisting coating applied to surfaces of the plate, whereby the plate can be rolled to form the corrugations after the application of the coating from flat sheet metal with the peaks and troughs oriented parallel to the rolling direction.

4,099,360

METHOD AND DEVICE FOR JOINING CONCRETE BODIES AND METHOD OF CONSTRUCTING A MULTI-STORY BUILDING

Christopher David Outram, Thames Ditton, England, assignor to CCL Systems, Ltd., Surbiton, England

Filed May 13, 1976, Ser. No. 686,450
Claims priority, application United Kingdom, May 13, 1975, 20185/75
Int. Cl.[2] E04G 21/00
U.S. Cl. 52—745 5 Claims



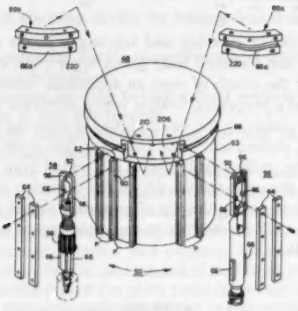
1. A method of joining spaced elongate vertical columns of concrete which comprises providing in a face of each column at least one screw threaded metal socket, the socket in one column having a thread opposite in direction to that in the socket of the other column, positioning one column over the other and spaced therefrom with the mouth of a socket in one column aligned with the mouth of the socket in the other column, locating between the two sockets an elongate coupling having an externally threaded portion at each end and an intermediate portion between the end portions and including a grip surface portion, the thread of one end portion being opposite in direction to that on the other end portion, and rotating the coupling by its grip surface while said columns are spaced so as to simultaneously screw the threaded portions into the

corresponding sockets a sufficient distance to adjust the spacing between said sockets such that the upper column remains spaced above the lower column but supported thereon by the connection between the sockets and the coupling, with the spacing between the sockets being defined by the length of the intermediate portion of the coupling.--

4,099,361
APPARATUS FOR AND METHOD OF CLOSING CONTAINERS

Joseph F. Dix, and Joseph Sampson, both of Baltimore, Md., assignors to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Mar. 20, 1972, Ser. No. 236,385
Int. Cl.[2] B67B *3/02, 3/12, 3/18;* B65B *7/28*
U.S. Cl. 53—42 18 Claims



16. In a capping machine which includes a rotatable turret adapted to receive either roll-on spindles or swage-on spindles with capping heads thereon for applying closures to containers and including an annular cam member with a grooved cam track therein for vertically moving such spindles when they are rotated about the axis of the turret, said spindles having cam followers on them for moving in the grooved cam track in said cam member and said cam member including a substantially horizontal leg for holding a roll-on spindle in a lowermost position in engagement with a closure on a container as the closure skirt is deformed against the container finish, the improvement comprising:

swage-on spindles which are adapted to be mounted in said rotatable turret with the capping head on each such spindle out of contact with a closure on a container when the cam follower on such spindle is in said horizontal leg of the grooved cam track in said annular cam member; and

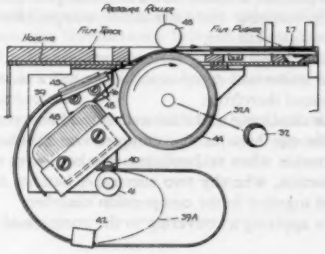
a replaceable cam section in said horizontal leg of said cam member and a U-shaped cam track in said section for camming a swage-on spindle with a capping head thereon downward to swage a closure on a container, and thereafter substantially immediately upward to strip the capping head from the closed container.

4,099,362
STRUCTURING MECHANISM IN READER-FILLER MACHINE FOR MICROFICHE JACKETS

Isidore Dorman, Whitestone, N.Y., assignor to NB Jackets Company, Chicago, Ill.

Filed Sep. 6, 1977, Ser. No. 830,811
Int. Cl.[2] B65B *5/10*
U.S. Cl. 53—123 9 Claims

1. In a reader-filler machine adapted to insert chips of microfilm into the respective channels of a multi-channel microfiche jacket, each channel having an entry slot adjacent the rear end of the jacket, the machine including a stationary film trackway, a drive mechanism to conduct the film to be inserted along the trackway toward the entry slot of the channel then in registration with the trackway and a pusher station provided with a film pusher parallel to the trackway whereby after a section of film loaded in this channel through the entry slot is severed from the film on the trackway to produce a film chip whose tail extends outside of the entry slot, the jacket is indexed to bring the next empty channel into registration with the trackway and the tail of the chip in the loaded channel into alignment with the pusher station to permit the film pusher to engage the tail and push it into the channel to complete the insertion, a structuring mechanism at said pusher station to be used for a chip whose length is shorter than the channel length to advance the



chip in the channel to a point where its leading edge coincides with the front end of the jacket, said mechanism comprising:

A. a retractable structuring pusher in the form of a relatively stiff ribbon whose thickness is at least about the same as that of the film;

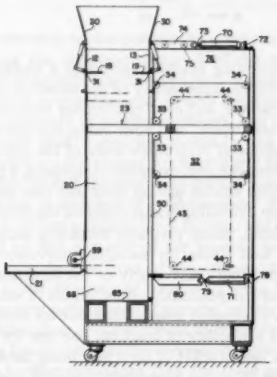
B. a track in a plane parallel to the plane of the film pusher to conduct the ribbon toward the entry slot in the channel; and

C. means to drive said ribbon along the track to cause the leading edge thereof to engage the trailing edge of the film chip therein and to advance the chip to the desired point, said drive means being reversible to retract said ribbon.

4,099,363
APPARATUS FOR COMPRESSING AND PACKAGING ARTICLES

Nikolai K. Wistinghausen, and Edward P. Banninga, both of Sarnia, Canada, assignors to Fiberglas Canada Ltd., Canada

Filed Jul. 11, 1977, Ser. No. 814,627
Claims priority, application Canada, Jun. 23, 1977, 281207
Int. Cl.[2] B65B *13/20, 63/02*
U.S. Cl. 53—124 D 12 Claims



8. Apparatus for compressing and packaging batts of insulating material, comprising:

an upwardly open chamber for receiving the batts in succession through the open top thereof;

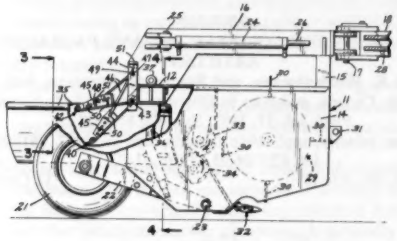
a compression chamber located beneath said chamber;
means for downwardly compressing the batts from said upwardly open chamber into said compression chamber;
said compression means including a pressure member and means for repeatedly moving said pressure member around an endless path of movement including a first path section extending downwardly through said upwardly open chamber and a second path section extending upwardly at the exterior of said upwardly open chamber, whereby successive batches of the articles are compressed into said compression space by the successive movements of said pressure member down said first path section;
means for retaining the batts under compression in said compression chamber;
said retaining means being movable between a first position located above said compression space and a second position spaced therefrom;
means for displacing said retainer into said first position to maintain the batts in the compression chamber under compression when said pressure member leaves said first path section, whereby two successive batches are compressed together in the compression chamber;
means for applying a convering to the compressed articles; and
means for simultaneously displacing the two compressed batches from said compression chamber to said covering applying means.

4,099,364

FLUFFER SHIELD SYSTEM FOR CROP HARVESTER

Glenn G. Kanengieter, Blooming Prairie, and Frank C. Krumholz, Owatonna, both of Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Nov. 4, 1976, Ser. No. 738,852
Int. Cl.[2] A01D *57/26*
U.S. Cl. 56—1 **4 Claims**



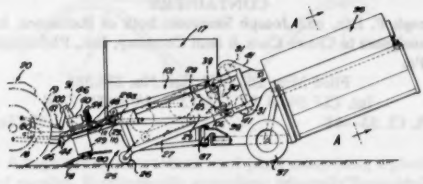
1. In a crop harvesting machine including a mobile frame elongated in a direction transversely of the direction of travel of the machine, a mower, and crop conditioner rolls extending longitudinally of said frame, said rolls being operative to deliver cut and conditioned crop rearwardly of the direction of travel of the machine; the improvement comprising, a plurality of cooperating fluffer shields having front and rear edges and disposed in a group extending transversely of the direction of travel of the machine, means pivotally mounting each of said fluffer shields to said frame for swinging movements on a horizontal axis extending transversely of the direction of the machine travel and independently of the others of said fluffer shields, a plurality of support arms at least one for each of said fluffer shields, and a plurality of brackets, one pair for each of said support arms, one bracket of each pair being mounted on said frame and the other on a respective one of said fluffer shields, each of said support arms having one end pivotally secured to one of the brackets of its respective pair and secured at its other end to a selected one of a plurality of spaced points on the other bracker of its respective pair thereof.

4,099,365

HARVESTING OF SUGAR CANE

John Colin Hudson, St. Thomas, Barbados, assignor to F.W. McConnel Limited, Ludlow, England

Continuation-in-part of Ser. No. 498,921, Aug. 20, 1974, abandoned. This application Oct. 14, 1976, Ser. No. 732,399
Int. Cl.[2] A01D *45/10*
U.S. Cl. 56—13.5 **29 Claims**



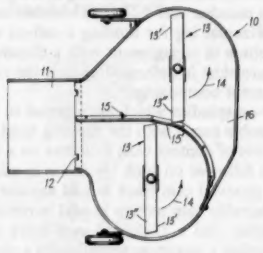
1. A method of cleaning and topping a swath of at least partially cut and flattened leafy green sugar cane, comprising passing over the swath of cane an apparatus, mounted on or towed behind a propelling vehicle which performs the successive steps of gathering the swath, lifting it from the ground on which it lies, pulling individual canes top first from the swath, supporting the stalk of each cane as it is pulled from the swath, accelerating the cane rearwardly of the direction of travel of the vehicle, restraining the top of each cane whilst continuing to move the stalk rearwardly to cause the top to break away from the stalk.

4,099,366

LAWN MOWERS

Clifford D. Peterson, Ankenny, Iowa, assignor to AMF Incorporated, White Plains, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,592
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—13.6 **2 Claims**



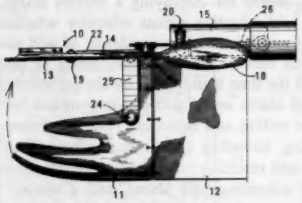
1. In a lawn mower having a twin-bladed grass cutter with rear discharge, said grass cutter comprising an open bottom housing having a top wall and a depending surrounding side flange, a pair of laterally spaced horizontal rotary grass cutting blades mounted in said housing between the lengthwise center line and opposite sides of said housing, said flange being discontinuous at the rear end of said center line to provide a rear opening on said housing for rear discharge of grass from said housing, and means for eliminating streaking along said center line, said means comprising a baffle mounted to said top wall and depending therefrom into said housing along said center line, wherein said opposite sides of said housing are arcuate and said baffle extends arcuately from one of said sides to between said blades and then along said center line to said rear opening, and said baffle depending into said housing to a maximum depth at each of its ends and then tapering therefrom to a minimum depth at its central portion.

4,099,367

FRUIT PLUCKING DEVICE

Yoshikane Ito, No. 238 Kawai, Koyataira-son, Mima-gun Tokushima-ken, Japan

Filed Jun. 17, 1976, Ser. No. 696,839
Int. Cl.[2] A01D *46/24*
U.S. Cl. 56—336 13 Claims



1. A fruit plucking device for cutting fruit from trees comprising:

scissor means for cutting the stems of said fruit, said scissor means comprised of:

a stationary member having a front portion with cutting edge of one side thereof,

a handle member connected to the rear portion of said stationary member, and

a movable crimping member pivotally connected to said stationary member, said movable member having: a front portion with a cutting edge on one side thereof adjacent the cutting edge of said front portion of said stationary member and contactable therewith, and a lever portion at the rear end of said front portion on the opposite side of the pivot point from said front portion;

holding means pivotally connected to and extending beneath said scissor means and operatively connected to said movable member for pivoting upward when said movable member is pushed and for catching and holding therein the fruit cut by said scissor means, said holding means having front and rear openings larger in diameter than the diameter of said fruit being picked; and

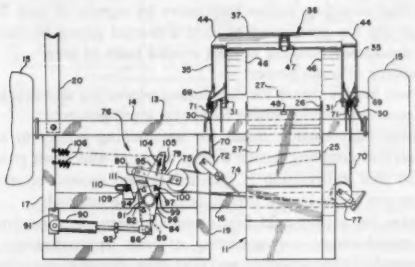
conveying means connected to the rear of said holding means and communicating with said rear opening of said holding means for conveying the cut fruit away from said holding means.

4,099,368

GATHERING UNIT CONTROL APPARATUS

Robert J. Mackert, Downers Grove; Donald P. Storm, Hinsdale, and Manfried L. Hoch, Lockport, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 6, 1976, Ser. No. 712,307
Int. Cl.[2] A01D *67/00*
U.S. Cl. 56—208 15 Claims



1. In a forage harvester having a basic processing unit having a frame and a crop gathering unit operatively associated with said basic unit for vertical articulative movement relative thereto about a transverse pivot axis, control apparatus for said gathering unit comprising:

a main lever pivotally mounted on said frame and having output means operatively connected to said gathering unit for pivoting said gathering unit about said transverse axis, the weight of said gathering unit imposing a first torque through said output means on said main lever;

a floatation spring lever having a first pivotal connection and a second detachable connection with said main lever;

floatation spring means interconnecting said floatation spring lever and said frame, said spring means imposing through said spring lever a balancing torque in opposition to said first torque on said main lever upon said detachable connection therebetween being in the attached state and said spring means imposing no balancing torque on said main lever upon said detachable connection being in the detached state; and

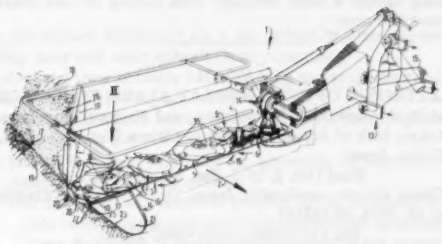
lift means interconnecting said main lever and said frame for selectively exerting a lifting torque in opposition to said first torque on said main lever.

4,099,369

MOWING DEVICE

Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed Oct. 5, 1976, Ser. No. 729,827
Claims priority, application Netherlands, Oct. 10, 1975, 7511970
Int. Cl.[2] A01D *63/00*
U.S. Cl. 56—314 26 Claims



1. A mowing device comprising a housing extending transversely of the direction of travel of the mowing device, a plurality of upright shafts journalled in said housing, driving gear means accommodated in said housing and driving the shafts, a plurality of cutting members, one fixed to the upper end of each shaft, supporting means having a supporting surface bearing on the ground for supporting the mowing device on the field so that the outermost cutting member at one end of the housing is disposed a predetermined distance above the ground to define a cutting level thereat, and at least one screen attached to said one end of the housing and having a front portion extending in front of the outermost cutting member, viewed in the direction of travel and being located just inside the outermost path of said outermost cutting member, but at a higher level than said outermost cutting member, said screen having a lower rim near the outermost cutting member, which extends further outwardly than the front portion and is disposed outside of the outermost cutting member, the lower rim of the screen being located at a higher level than the supporting surface approximately at said predetermined distance above the ground.

4,099,370
TWISTED CORE YARN

John Umiastowski, 127 Sunnyside Place, Dollard des Ormeaux, Quebec, Canada (H9A 1V9)

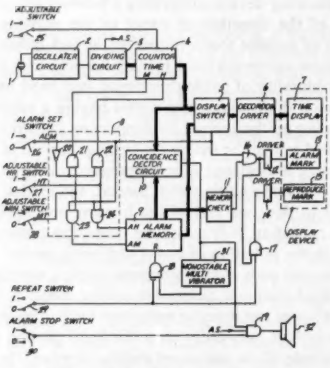
Division of Ser. No. 562,113, Mar. 26, 1975, Pat. No. 4,056,924.
This application Mar. 11, 1976, Ser. No. 665,767
Claims priority, application Canada, Mar. 29, 1974, 196403
Int. Cl.[2] D02G 3/36
U.S. Cl. 57—144 6 Claims

1. Yarn comprising an elongated flexible core at least part of which is twisted in a given direction, and a plurality of surface fibers carried by said core at said twisted part thereof and forming a composite yarn structure with said core, said surface fibers being helically wound around said twisted part of said core in a direction opposite to the direction of twist of said part of said core for maintaining said part of said core twisted in said given direction, said surface fibers being twisted to a greater extent than said twisted part of said core with said core having therein a twist resulting from pulling of said fibers around said core.

4,099,371
ELECTRONIC OPTICAL DISPLAY ALARM TIMEPIECE

Yoshifumi Mochizuki, Tokorozawa, and Shigeru Morokawa, Tokyo, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,756
Claims priority, application Japan, Oct. 4, 1974, 49-114498; Dec. 18, 1974, 49-145183
Int. Cl.[2] G04B 23/02; G04C 21/00
U.S. Cl. 58—22.7 1 Claim

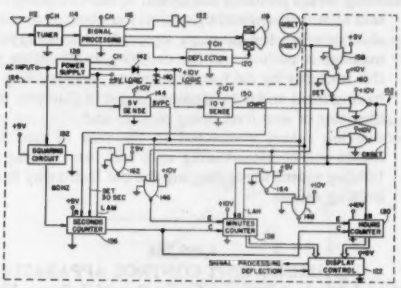


1. An electronic timepiece having an alarm, comprising an electro-optical display for selectively displaying the time and an alarm time setting on the same element of said display and for displaying a first alarm mark indicative of the condition of said alarm whereby the presence or absence of an alarm time setting is indicated by the presence or absence of said alarm mark; means for activating said first alarm mark for each coincidence of said alarm time setting and the time or for the first coincidence of said alarm time setting and the time; means for selecting the each coincidence or first coincidence mode of activation; means for displaying a second alarm mark in response to said selecting means whereby whether said alarm will be activated for each coincidence of said alarm time setting and the time or the first coincidence of said alarm time setting and the time is indicated by the presence or absence of said second alarm mark; and memory means for storing said alarm time setting and including resetting means, said means for selecting, including a logic means having an output connected to said resetting means, a first input connected to said means for activating said alarm, and a second input means connected to a selector switch means.

4,099,372
TIMEKEEPING APPARATUS WITH POWER LINE DROPOUT PROVISIONS

Billy Wesley Beyers, Jr., Greenfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,368
Int. Cl.[2] G04C 17/00; H02J 9/00
U.S. Cl. 58—85.5 13 Claims



1. A timekeeping apparatus comprising:

a source of reference frequency signal;

first counting means responsive to said reference frequency signal for generating a first group of binary signals representing first units of time;

second counting means responsive to signals of said first group for generating at least a second group of binary signals representing at least second units of time;

a source of input power;

power supply means for developing power for said first and second counting means from said input power;

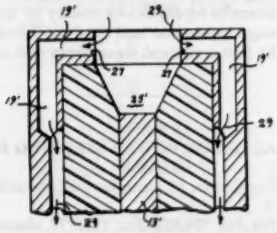
power maintenance means for maintaining power to said second counting means during a loss of said input power so that information is retained in said second counting means for at least a predetermined time interval;

means for setting said first counting means to a predetermined count corresponding at least approximately to one-half the number of said first units of time in one of said second units after a temporary loss of power having a duration less than said predetermined time interval so that over a number of temporary losses of power the count accumulated in said first counter means will at least approximately correspond to the correct time.

4,099,373
VENTED IGNITER

William W. Griffin, Jr., Lake Park, and Robert M. Pierce, Tequesta, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 11, 1977, Ser. No. 795,821
Int. Cl.[2] F02C 7/18, 7/26
U.S. Cl. 60—39.67 3 Claims

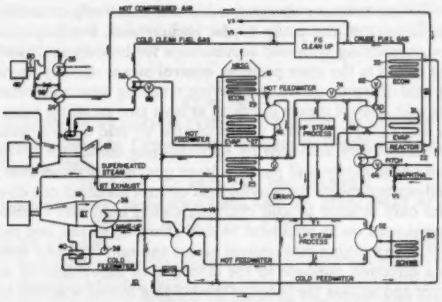


1. An improved spark igniter for use in a gas turbine engine having a combustion means, said igniter comprising a central electrode, a ceramic insulator surrounding said central electrode and extending beyond the tip thereof, an outer shell positioned around said ceramic insulator and extending over the end surface thereof, said outer shell being spaced from the tip of said central electrode to form an electrode cavity in which a spark gap is formed, at least one vent passage in said outer shell for receiving a fuel-air mixture from within the engine, said vent passage being in communication with an outlet area of lower pressure, and at least one inlet opening in the side wall of the outer shell in the upper portion of the electrode cavity in communication with the vent passage such that the fuel-air mixture entering said opening passes near the tip of the central electrode in the electrode cavity causing the mixture to be ignited when the igniter is activated.

4,099,374
GASIFIER-COMBINED CYCLE PLANT

Richard W. Foster-Pegg, Media, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 15, 1976, Ser. No. 677,194
Int. Cl.[2] F02B 43/08
U.S. Cl. 60—39.12 5 Claims

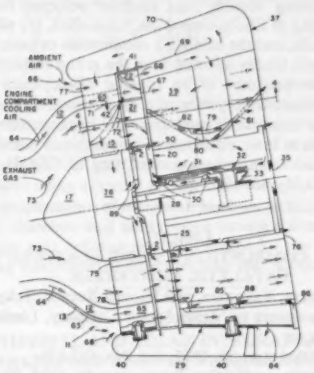


1. An electric power plant having a steam turbine and a gasifier system, said plant comprising at least one gas turbine set and at least one heat recovery steam generator which receives hot gas turbine exhaust gas to produce steam for operating the steam turbine, means for supplying a fossil fuel to said gasifier system, means for supplying compressed air from said gas turbine set to said gasifier system, means for controlling the flow of gasifier input fossil fuel as a function of a signal which is dependent on the variation in air flow to the gasifier system as plant load changes occur, means for cooling and cleaning generated fuel gas, and means for reheating the generated fuel gas for use in said gas turbine set.

4,099,375
EXHAUST PLUME REDUCTION AND COOLING SYSTEM

Clinton F. Inglee, Media, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1977, Ser. No. 765,500
Int. Cl.[2] F02C 7/18
U.S. Cl. 60—39.5 6 Claims



1. An exhaust suppressor for a gas turbine or other engine having inner and outer exhaust ducts comprising:

a duct and vane assembly for supporting said suppressor and initially distributing hot exhaust gases;

a plenum and shroud assembly for mixing hot exhaust gases with cooling air;

a turbine and vane assembly for powering the operative components of said suppressor,

said duct and vane assembly coupled to the periphery of said outer exhaust duct and including hollow upstream vanes transverse to and initially intercepting hot engine exhaust gases,

said outer exhaust duct providing for discharge of engine compartment cooling air, and said inner exhaust duct providing for discharge of hot exhaust gases,

said plenum and shroud assembly coupled to and surrounding said duct and vane assembly and including hollow shielding vanes adapted to mix and distribute hot exhaust gases and cooling air, and shroud means retaining and circulating cooling air to and through the vanes of said assembly,

said turbine and vane assembly positioned within and supported by said plenum and shroud assembly and including a centrally disposed exhaust turbine having turbine blades deployed in the path of engine exhaust gases downstream of said vanes in said duct and vane assembly,

said shielding vanes angled relative to the central axis of said suppressor so as to hide all components forward thereof; and

a cover secured to said plenum and shroud assembly at the aft end thereof for hiding said turbine from external view aft of said suppressor.

4,099,376

GAS GENERATOR AND SOLID PROPELLANT WITH A SILICON-OXYGEN COMPOUND AS A BURNING RATE MODIFIER, AND METHOD FOR MAKING THE SAME

Archie B. Japs, Akron, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Jun. 29, 1955, Ser. No. 519,002
Int. Cl.[2] F02K 9/04; C06B 45/10
U.S. Cl. 60—253 3 Claims

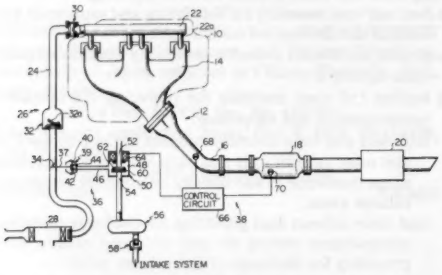
2. An article of manufacture useful as a gas generator and comprising a container having an outlet and supported and adapted to burn within said container and adhere to the walls of said container a mixed, shaped and cured composition of matter characterized by generating large volumes of gas on combustion and, except for minor amounts of compounding ingredients, consisting essentially of from about 70 to 87% by weight of finely-divided dried ammonium perchlorate, from about 0.5 to 5.0% by weight of at least one high surface area finely-divided essentially anhydrous inorganic silicon and oxygen-containing burning rate modifier selected from the group consisting of silicon monoxide, fume silica, arc silica and silicon oxyimide, and the balance a combustible organic elastomeric polymeric binder selected from the group consisting of a cured polyesterurethane of an organic diisocyanate and a hydroxyl terminated polyester of a dibasic acid and a glycol and a polymer comprising predominantly linear carbon chains cured through at least a portion of its combined curable acid groups selected from the class consisting of COOH, SO_3H, SO_2H and PO_3H_2 radicals.

4,099,377

INTERNAL COMBUSTION ENGINE EQUIPPED WITH CATALYTIC CONVERTER

Tooru Yoshimura, Yokosuka, and Hiroshi Kuroda, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 28, 1976, Ser. No. 681,176
Claims priority, application Japan, Apr. 28, 1975, 50-51858
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—276 21 Claims



1. An internal combustion engine having a combustion chamber therein, comprising:

a catalytic converter for catalytically purifying the exhaust gases discharged from the combustion chamber;

an exhaust passage means communicating the combustion chamber with said catalytic converter;

secondary air supply means for supplying secondary air into said exhaust passage means upstream of said catalytic converter to promote the catalytic purification of the exhaust gases carried out within said catalytic converter;

an exhaust gas sensor disposed in said exhaust passage means upstream of said catalytic converter adapted to generate a first composition information signal when the oxygen-combustibles ratio of the exhaust gases passing through said exhaust passage means upstream of said catalytic converter is lower than a first predetermined level;

a temperature sensor disposed in said catalytic converter and adapted to generate a first temperature information signal when the temperature within said catalytic converter is lower than a second predetermined level;

a control circuit electrically connected to said exhause gas sensor and said temperature sensor and adapted to generate a first command signal upon receiving at least one of the first composition information signal from said exhaust gas sensor and the first temperature information signal from said temperature sensor; and

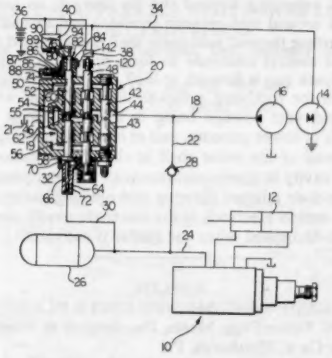
secondary air regulating means for allowing said secondary air supply means to supply the secondary air through said exhaust passage means into said catalytic converter upon receiving the first command signal from said control circuit.

4,099,378

BLOCKING VALVE FOR POWER STEERING FOR LIFT TRUCKS

Walter M. Shaffer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 759,951, Jan. 17, 1977, abandoned. This application Sep. 16, 1977, Ser. No. 833,897
Int. Cl.[2] F15B 1/02
U.S. Cl. 60—413 24 Claims



1. In a hydraulic system having a prime mover, a pump driven by said prime mover, an accumulator, a supply tank, an implement actuating unit connected to said accumulator, an implement actuating valve between the pump and the tank, a check valve permitting flow from the pump to the accumulator, an accumulator charging means for selectively controlling the flow from the pump to the accumulator, holding means communicating with said accumulator for holding said charging means in the open position, control means slidably carried on said charging means and having retaining means for retaining said control means in one of at least two positions relative to said charging means, means carried by said control means and selectively activated by said charging means for driving said prime mover and pump, a lever operatively connected to said control means for moving said control means in one direction only relative to said charging means until said retaining means seats on an abutment on said charging means, and resilient means urging said control means and said charging means in a direction opposite to the direction of movement by said lever and against the force of the holding means whereby low pressure in the accumulator will permit the resilient means to drive the control means and the charging means to a position to block the flow through the implement valve and to close the means for selectively activating said prime mover and pump whereby the pump will charge the accumulator and upon completing the charge of the accumulator, pressure in the accumulator will cause the holding means to move the charging means to open the flow through the implement valve and to urge the charging means to unseat the retaining means from

the abutment to open the selectively activated means and shutoff the prime mover and pump.

4,099,379

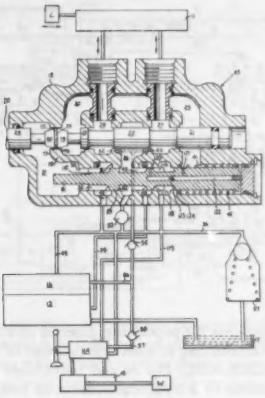
LOAD RESPONSIVE FLUID CONTROL SYSTEM

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 522,324, Nov. 8, 1974, Pat. No. 3,998,134, and Ser. No. 559,818, Mar. 19, 1975, Pat. No. 3,984,974. This application Feb. 5, 1976, Ser. No. 655,561

Int. Cl.² F15B *13/08*

U.S. Cl. 60—427 **51 Claims**



38. A valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, an outlet chamber, an exhaust chamber, and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said fluid outlet chamber and said fluid supply chamber, variable metering orifice means responsive to movement of said first valve means and operable to throttle fluid between said outlet chamber and said exhaust chamber, second valve means having fluid throttling means, fluid isolating means between said inlet chamber and said supply chamber, said second valve means having means responsive to pressure differential at variable pressure level acting across said variable orifice means and operable to maintain said pressure differential relatively constant while pressure at said variable orifice means is permitted to vary, and fluid replenishing means to interconnect for fluid flow said fluid supply chamber and said fluid exhaust means when said fluid isolating means isolates fluid supply chamber from said fluid inlet chamber.

4,099,380

MASTER-CYLINDER FOR HYDRAULIC BOOSTER

Leonardo Cadeddu, Crema, Italy, assignor to Benditalia S.p.A., Crema, Italy

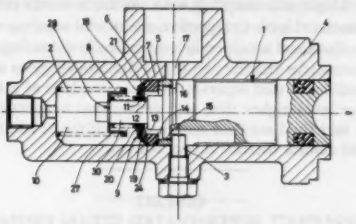
Filed Oct. 22, 1976, Ser. No. 734,915

Claims priority, application Italy, Oct. 23, 1975, 28610 A/75

Int. Cl.² B60T *11/26;* **F15B** *7/08*

U.S. Cl. 60—588 **8 Claims**

1. In a master cylinder comprising: a housing having a bore for receiving a sliding piston, said piston cooperating with said housing to define a pressure chamber in said bore, said bore being connected to a utilizing circuit, a packing seal being disposed around the head of said sliding piston adjacent to said pressure chamber, said packing seal having a peripheral edge sealingly sliding in said bore and an inner edge defining a radial clearance with the head of said piston, said packing seal being mounted between a shoulder on the head of said piston and a stop means resiliently urged toward an abutment on said piston head, said packing seal by fluid-tight cooperation with said shoulder controlling the fluid communication between said pressure chamber and a low pressure reservoir, and a low preloaded safety valve associated with the head of said piston and the packing seal to control said fluid communication as an in line relationship, said safety valve permitting fluid to flow from said low pressure reservoir into said pressure chamber when said piston returns to its rest position in the event of creation of a negative pressure in said pressure chamber, said packing seal cooperating with a sleeve which engages a stop pin secured to said housing when said piston is in its rest position so as to overcome an intermediate spring and seat off the packing seal and the central part of the safety valve from the shoulder and the abutment respectively, thus creating an axial clearance between said packing seal and said shoulder, said safety valve being a frontal sealing-tight valve axially movable along a protuberance of the piston head projecting towards the pressure chamber, said safety valve having a central substantially rigid part defining said stop means for the packing seal and being adapted to sealingly engage said abutment.



4,099,381

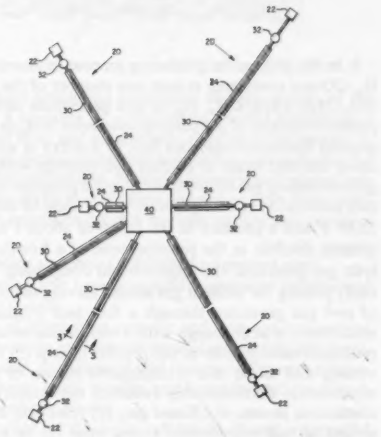
GEOTHERMAL AND SOLAR INTEGRATED ENERGY TRANSPORT AND CONVERSION SYSTEM

Marc D. Rappoport, P.O. Box 10445, Portland, Oreg. 97210

Continuation-in-part of Ser. No. 593,773, Jul. 7, 1977, abandoned. This application Sep. 9, 1977, Ser. No. 831,888

Int. Cl.² F03G *7/02*

U.S. Cl. 60—641 **2 Claims**



1. An energy transport and conversion system for conducting geothermal energy from a plurality of geographically dispersed geothermal sources to a common central thermal power station without substantial loss of geothermal energy comprising:

(a) multiple geothermal means spaced from one another, each for transferring geothermal energy at a predeter-

mined geothermal temperature level from a naturally heated material beneath the earth's surface to a fluid medium;

(b) a central thermal power station spaced away from each of said multiple geothermal means including means for receiving thermal energy from said fluid medium;

(c) multiple separate elongate conduits, each respectively coupled between one of said multiple geothermal means and said thermal power station for conducting said fluid medium therethrough toward said central thermal power station; and

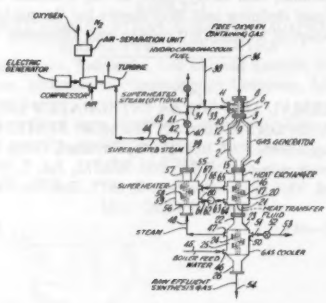
(d) multiple concentrating solar collector means each being associated with a respective one of said separate elongate conduits and arranged in longitudinally extending relation thereto, for transferring focused solar energy to said fluid medium in said separate elongate conduits at a temperature level higher than said geothermal temperature level as said fluid medium moves through the conduit toward said central thermal power station.

4,099,382

BY-PRODUCT SUPERHEATED STEAM FROM THE PARTIAL OXIDATION PROCESS

Peter L. Paull, Weston, Conn., and Rodney McGann, Northridge, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,439
Int. Cl.[2] F01K *27/00*
U.S. Cl. 60—648 **45 Claims**



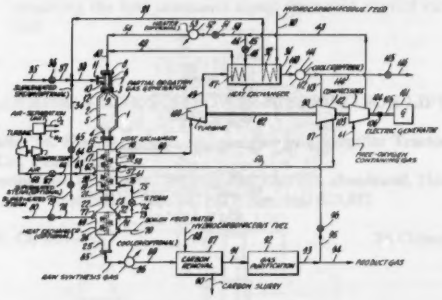
1. In the process for producing gaseous mixtures comprising H_2, CO and containing at least one member of the group H_2O, CO_2, H_2S, COS, CH_4, N_2, A and particulate carbon, by the partial oxidation of a hydrocarbonaceous fuel, or liquid oxygenated hydrocarbonaceous fuel, or a slurry of solid carbonaceous fuel and water or a liquid hydrocarbon with a free-oxygen containing gas and optionally in the presence of a temperature moderator, at a temperature in the range of about 1500° to 3500° F and a pressure in the range of about 1 to 250 atmospheres absolute in the reaction zone of a free-flow noncatalytic gas generator, the improvement comprising: (1) continuously passing the effluent gas stream leaving the reaction zone of said gas generator through a first heat exchange zone in noncontact heat exchange with a continuous stream of steam produced subsequently in the process in step (3) thereby converting said steam into a continuous stream of superheated steam while simultaneously reducing the temperature of the continuous stream of effluent gas; (2) removing a continuous stream of said superheated steam from (1) as a by-product stream; (3) continuously passing the stream of effluent gas leaving the first heat exchange zone in (1) directly into a second heat exchange zone where it passes in noncontact heat exchange with a stream of water, thereby converting said water into a continuous stream of steam, while simultaneously reducing the temperature of the continuous stream of effluent gas; (4) removing a stream of raw effluent product gas; and (5) introducing at least a portion of the stream of steam from (3) into the first heat exchange zone in (1) as said steam.

4,099,383

PARTIAL OXIDATION PROCESS

Peter L. Paull, Weston, Conn., and Rodney McGann, Northridge, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,438
Int. Cl.[2] F01K *27/00*
U.S. Cl. 60—648 **37 Claims**



1. In the process for producing gaseous mixtures comprising H_2, CO and containing at least one member of the group H_2O, CO_2, H_2S, COS, CH_4, N_2, A and particulate carbon, by the partial oxidation of a hydrocarbonaceous fuel, or liquid oxygenated hydrocarbonaceous fuel, or a slurry of solid carbonaceous fuel and water or a liquid hydrocarbon, with a free-oxygen containing gas and optionally in the presence of a temperature moderator, at a temperature in the range of about 1500° to 3500° F and a pressure in the range of about 1 to 250 atmospheres absolute in the reaction zone of a free-flow noncatalytic gas generator, the improvement comprising: (1) continuously passing the raw effluent gas stream leaving the reaction zone of said gas generator through a first heat exchange zone in noncontact heat exchange with a continuous stream of a gaseous heat transfer fluid selected from the group superheated steam, helium, nitrogen, argon, hydrogen, and gaseous mixtures comprising H_2+CO; (2) introducing the stream of hot gaseous heat transfer fluid leaving (1) into a power developing means as the working fluid and thereby producing power; (3) cooling the gaseous heat transfer fluid leaving (2) by noncontact heat exchange with at least one of the feed materials to said gas generator and optionally with water in a separate heat exchange zone; and (4) compressing the cooled gaseous heat transfer fluid leaving (3) by means of a gas compressor driven by said power developing means and recycling the compressed gaseous heat transfer fluid into the first heat exchange zone in step (1).

4,099,384

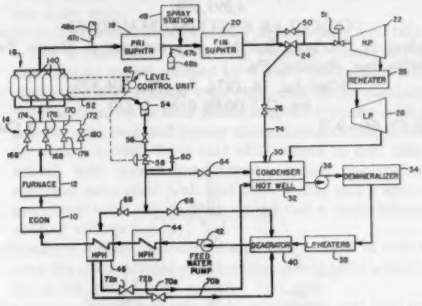
INTEGRAL SEPARATOR START-UP SYSTEM FOR A VAPOR GENERATOR WITH CONSTANT PRESSURE FURNACE CIRCUITRY

William D. Stevens, North Caldwell, and Walter P. Gorzegno, Morristown, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 538,236, Jan. 2, 1975, abandoned. This application Aug. 10, 1976, Ser. No. 713,313
Int. Cl.[2] F01D *19/00*
U.S. Cl. 60—657 **9 Claims**

1. A vapor generating system for use in a power plant having a steam turbine and a condenser connected in a series flow relationship; said system comprising a vapor generating section for receiving a heat exchange fluid and applying heat to said fluid; a superheating section for applying additional heat to said fluid; fluid flow circuitry directly connecting said vapor

generating section to said superheating section; a pressure control section connected directly in said fluid flow circuitry in a series flow relation with said vapor generating section and said superheating section for receiving said fluid from said vapor generating section and controlling the pressure of said fluid; and separation means connected directly in said fluid flow circuitry between said pressure control section and said superheating section in a series flow relation therewith for separating said fluid into a liquid and a vapor and passing the vapor to said superheating section; said pressure control section including a plurality of conduits connected in a parallel fluid flow relationship, at least one of said conduits adapted to receive fluid from said furnace section during start-up and full load operation of said vapor generating section, and valve means disposed in at least one of said other conduits for selectively controlling the fluid pressure in said furnace after a predetermined amount of heat has been added to said fluid; said separation means comprising a plurality of separators connected in a parallel relationship and adapted to receive fluid from said conduits during start-up and full load operation of said vapor generating section.

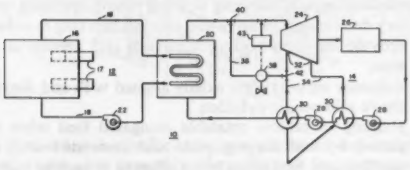


4,099,385

EXTENDED FUEL CYCLE OPERATION FOR PRESSURIZED WATER REACTOR PLANTS

George J. Silvestri, Jr., Morton, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1976, Ser. No. 653,174
Int. Cl.[2] F01K 7/34; G21C 9/00
U.S. Cl. 60—678 7 Claims



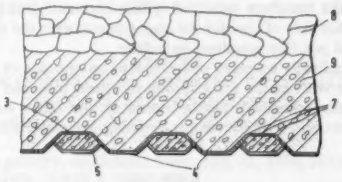
1. A power plant comprising:
- a source of motive fluid having a predetermined pressure associated therewith,
- a turbine element having an inlet and an outlet end, said inlet end being in fluid communication with said motive fluid source,
- a heat rejection element for liquefying said motive fluid to condensate, said heat rejection element being in fluid communication with said turbine's outlet end,
- a heat recovery element for heating the condensate and passing it therethrough to said motive fluid source;
- an extraction conduit connected at a first end to a predetermined point within said turbine between said inlet and said outlet ends and at a second end to the heat recovery element,
- a bypass conduit disposed so as to provide fluid communication between said motive fluid source and said extraction conduit,
- a flow control device for regulating fluid flow through said bypass conduit, and,
- means for opening said flow control device in response to said motive fluid's pressure dropping a predetermined amount below said motive fluid's predetermined pressure causing motive fluid flow through said bypass conduit whereby a first portion of said bypassed motive fluid can be supplied to the turbine element through the extraction conduit while a second portion of said bypassed motive fluid can be routed to said heat recovery element.

4,099,386

ARRANGEMENTS USED FOR SHORING EXCAVATIONS IN THE GROUND

D. Lucio Arana Sagasta, Coso, 34, Zaragoza, Spain

Filed Aug. 19, 1976, Ser. No. 715,842
Claims priority, application Spain, Oct. 8, 1975, 441.608
Int. Cl.[2] E01G 5/00
U.S. Cl. 61—45 R 1 Claim



1. In a tunnel lining and excavation shoring system of the type having a plurality of substantially parallel spaced-apart trusses spaced from and substantially parallel to the surface to be shored, and metal plating unit attached to and spanning the spaces between said trusses, the space between said plating unit and the surface to be shored being adapted to later filling with concrete, the improvement of a modular plating unit comprising:
- (a) said plating unit being fabricated of pressed steel;
- (b) said plating unit having parallel trapezoidal longitudinal channels therein;
- (c) a row of alternating convex and concave trapezoidal shapes between each pair of parallel trapezoidal longitudinal channels, the apices of said convex and concave trapezoidal shapes being parallel and being located in spaced-apart imaginary planes;
- (d) the junction of the walls and apices of said trapezoidal longitudinal channels and said alternating convex and concave trapezoidal shapes being straight and comprising lines for action as flexing points;
- (e) windows between adjacent concave and convex trapezoidal shapes; and
- (f) said windows reducing the length of one of said concave and convex trapezoidal shapes.

4,099,387

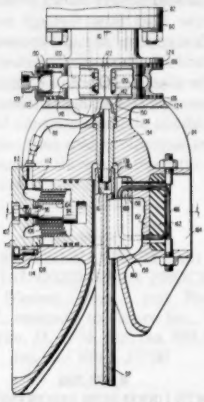
SHEET STEEL PILE CLAMP

Leonard L. Frederick, 15 Crestview Ter., Whippany, N.J. 07981, and Edwin E. Greigg, 509 Notley Rd., Silver Spring, Md. 20904

Division of Ser. No. 672,447, Mar. 31, 1976, abandoned, which is a continuation of Ser. No. 486,624, Jul. 8, 1974, abandoned. This application Dec. 3, 1976, Ser. No. 747,134

Int. Cl.[2] E02D *11/00*

U.S. Cl. 61—63 11 Claims



1. A universal sheet pile clamp for clamping a vibratory hammer to a sheet pile, comprising:

a body portion having means at one end for fixedly connecting the body portion to a vibratory hammer, a slot formed at the other end for receiving the top portion of a sheet pile, and a main blind bore which intersects the slot; and

jaw-like members mounted within the main blind bore on either side of the slot for engagement with the sheet pile, said jaw-like members including:

hydraulically actuated piston means on one side of the sheet pile with means for gripping the sheet pile; and

laterally adjustable piston means on the other side of the sheet pile with means for gripping the sheet pile.

4,099,388

DRIVE SHIELD FOR TUNNELING APPARATUS AND A METHOD FOR OPERATING SUCH A SHIELD

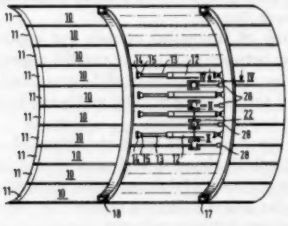
Heinz Hüsemann, and Herbert Heitkamp, both of Werne, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Oct. 18, 1976, Ser. No. 733,232

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1975, 2546755

Int. Cl.[2] E01G *3/00, 3/02*

U.S. Cl. 61—85 8 Claims



1. A drive shield for use in tunnel driving comprising: a plurality of elongate drive members arranged side-by-side in parallel relationship around the tunnel axis; a frame supporting and guiding the members for individual longitudinal displacement; fluid rams coupled between the frame and the drive members and operable to advance the drive members in successive stages and to shift up the frame when the drive members have all been advanced; and automatic means for inhibiting relative movement of the drive members when the frame is being shifted by the rams, the reaction forces produced by the shifting movement being distributed evenly to the drive members.

4,099,389

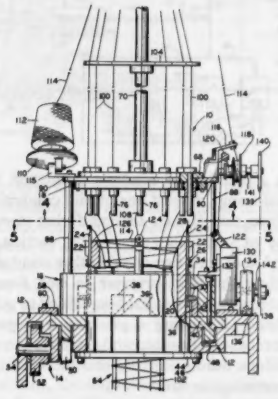
CIRCULAR KNITTING MACHINE

Herbert H. Herbein, Reiffton, Pa., assignor to Ripple Twist Mills, Inc., Reading, Pa.

Filed Jul. 19, 1976, Ser. No. 706,529

Int. Cl.[2] D04B *9/16, 15/50*

U.S. Cl. 66—9 R 1 Claim



1. A circular knitting machine for knitting a netting comprised of a plurality of circumferentially spaced warp wales incorporating an elastic weft yarn in a helical manner in the knit chain stitches of the individual warp wales, said machine comprising in combination:

a stationary slotted needle cylinder mounted on a base

circumferentially spaced latch needles disposed in slots of said needle cylinder, each of said latch needles being provided with a latch having an open position and a closed position;

a rotatable annular cam ring defining needle operating cams;

rotary drive means to drive said annular cam ring in order to provide for reciprocating motion of said needles in said slots;

a stationary support plate axially aligned with and disposed above said needle cylinder;

a plurality of hollow rotatable elongated feed tubes supported by said support plate and associated with said needles, said feed tubes being adapted to receive individual warp yarns approximately concentric with the center line thereof;

each of said feed tubes being provided with at least one aperture extending substantially laterally therethrough near one end thereof, said feed tubes being adapted to feed individual warp yarns to said needles through said apertures;

a driving member disposed above said needle cylinder and adjacent said feed tubes, each of said feed tubes being provided with a driven member whereby rotation of said driving member produces rotation of said driven members and said feed tubes;

said driving member being interconnected to said rotatable

cam ring such that rotation of said cam ring produces rotation of said driving member;

at least one bobbin of elastic weft yarn mounted on said driving member for feeding weft yarn across the warp yarns;

a plurality of latch wires carried by said annular cam ring and which cooperate with said latch needles in order to prevent premature closure thereof when the latch needles are in a raised position;

weft yarn feed control means for controlling the feed of elastic weft yarn to said needle cylinder, said weft yarn being incorporated, unknit, in the spaced chain stitches of the warp wale;

said weft yarn feed control means comprising a feed take-up wheel mounted on said driving member, means to rotate said take-up wheel defined by a drive mechanism associated with said annular cam ring, said drive mechanism being defined by an idler wheel adapted to rotate with said annular cam ring and power transmission means to transfer rotary motion from said idler wheel to said take-up wheel, said power transmission means comprising a sprocket associated with said idler wheel and a sprocket associated with said take-up wheel and a chain interconnecting said sprockets;

adjustment means provided at said idler wheel in order to vary the circumference of rotation of said idler wheel and the speed of said idler wheel;

the relationship of said rotary drive means to said feed tubes and said annular cam ring of said needle cylinder being such that said warp yarns are fed to said needles during each circular rotation of said feed tubes.

4,099,390

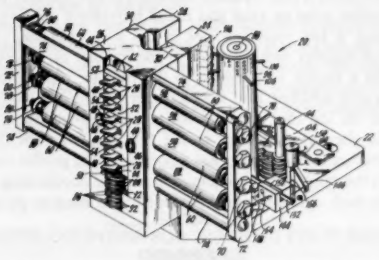
SELECTION DEVICE FOR THE NEEDLES OF A KNITTING MACHINE

Juan Vinas, Middle Village, N.Y., assignor to Vinatex Knitting Systems, Inc., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 520,417, Nov. 4, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 711,105

Int. Cl.² D04B *15/78, 15/74*

U.S. Cl. 66—50 R **18 Claims**



1. A selection device for knitting machines having a rotating cylinder with slots around its circumference for accommodating knitting needles and associated needle jacks therein, said device comprising:

(a) a plurality of jack selector means each having a deflectable end portion and cam means spaced from a free end of said deflectable portion and integral therewith;

(b) support means for positioning said jack selector means relative to the cylinder whereby said free end of each said jack selector means operatively coacts with associated needle jacks;

(c) actuator means for deflecting selected ones of said jack selector means in accordance with a predetermined program, said actuator means including cam follower means for engaging said cam means and thereby deflecting said deflectable end portion of said jack selector means in a direction whereby the needle jack associated therewith is engaged and displaced; and

(d) means for changing said direction of deflecting said deflectable end portion including a comb-like member having a plurality of teeth defining comb slots therebetween, said deflectable end portion of each said jack selector means extending through said comb slots and being disposed against either of two opposite surfaces of adjacent teeth.

4,099,391

LATCH KNITTING NEEDLE AND METHOD OF MAKING SAME

Masao Fukuhara, Nishimuro, Japan, assignor to Fukuhara Needle Co., Ltd., Wakayama, Japan

Filed Nov. 18, 1977, Ser. No. 852,785

Claims priority, application Japan, Jul. 6, 1977, 52-81176

Int. Cl.² D04B *35/04*

U.S. Cl. 66—121 **6 Claims**

1. In a pivotted latch needle having a stem portion, a slot formed in said stem portion, a latch pivotally disposed in said slot for oscillating movement between its opened and closed positions, the said latch having a spoon-shaped end thereof, an improved seat in said needle to receive said spoon-shaped end of said latch therein when the latter is in its said opened position, said seat comprising a concave-shaped recess formed in said stem portion, the shape of the surface of said recess conforming to the shape of the exterior surface of an arcuate section of a right circular cone the axis of which is in a plane extending lengthwise of said slot.

4,099,392

YARN CUTTING AND GRIPPING DEVICE FOR A CIRCULAR KNITTING MACHINE

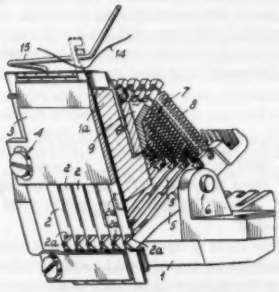
Francesco Lonati, Via Valsorda, 28, Brescia, Italy

Filed May 31, 1977, Ser. No. 802,096

Claims priority, application Italy, Jun. 21, 1976, 24512 A/76; Nov. 18, 1976, 29510 A/76

Int. Cl.² D04B *15/60*

U.S. Cl. 66—140 R **10 Claims**



1. A yarn cutting and gripping device for a circular knitting machine, and particularly for a double-cylinder circular knitting machine, said device comprising a fixed blade, a plurality of adjacent strip-like elements, movable back-and-forth along the length thereof adjacently said fixed blade and each having a hooked end lying on the same plane as said strip-like elements, said hooked end having a cutting edge adapted to coop-

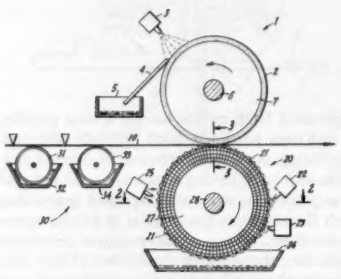
erate with said fixed blade to effect the cutting of the yarn, an elastically biassed body arranged on the opposite side to said fixed blade for pressing said strip-like elements against said fixed blade, said body acting as a gripping means for the yarn cut by the device, wherein each of said strip-like elements has, between said hooked end and remaining portion thereof, a lug spaced apart from said hooked end and extending substantially parallel thereto, the surface of said lug facing said fixed blade being recessed with respect to the plane of cutting by an extent substantially corresponding to the transverse dimension of the yarn to be cut and gripped.

4,099,393

SPACE PRINT HEAD DRAW ROLLS

Alan Hedley Norris; Edwin Dwain Cromer, and Phillip Wayne Chambley, all of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 696,637, Jun. 16, 1976, abandoned.
This application Jul. 13, 1977, Ser. No. 815,080
Int. Cl.[2] D06B *1/14, 15/02*
U.S. Cl. 68—22 R **9 Claims**



1. In a yarn space dyeing apparatus comprising a print mechanism for applying dye in a controlled pattern to yarn passing into contact therewith under tension between a feed roll and the nip of a first and second draw roll, said print mechanism including at least one print roll in communication with dye paste-containing vessel for spreading the dye paste on the yarn in a controlled pattern, said draw rolls including first and second counter-rotating rolls mechanically engaged with each other, said first roll including a core and a link wire sheath covering the exterior surface of said core, the links of said wire sheath being spaced apart to provide a coarse mesh and discrete points of substantially tangential contact between said first and second rolls; said second roll including a core and a resilient covering on the exterior surface of said second roll core; and means for rotating said first and second rolls in opposite directions whereby said draw rolls maintain tension in and advance the dye pasted yarn without displacing the pattern of the dye paste contained on said yarn.

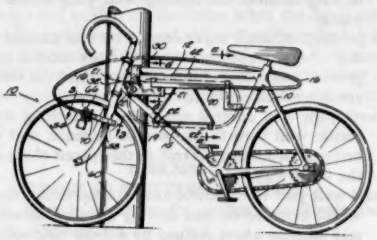
4,099,394

BICYCLE CABLE LOCKING DEVICE

Laszlo Joo, 3002 W. Kilbourn Ave., Milwaukee, Wis. 53208

Filed May 31, 1977, Ser. No. 801,487
Int. Cl.[2] E05B *71/00*; B62H *5/00*
U.S. Cl. 70—233 **4 Claims**

1. A bicycle locking device comprising a storage reel, connecting means for connecting said storage reel to a bike frame with said reel being located between the front wheel and seat, a flexible cable, first means for securing a first end of said cable to said reel, and second means for securing the other end of said cable to said bike frame, said second means comprising a socket adapted to be clamped to the bike frame, and said second means further including a plug on said second cable end receivable in said socket aperture and registrable openings on said plug and said socket to receive the shackle of a lock and wherein said connecting means for said storage reel comprises hinge means, which means affords movement of said reel relative to the bike frame between a swung out access position



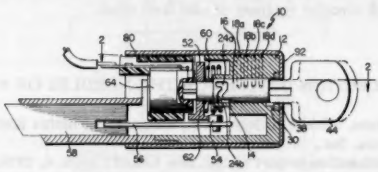
and a storage position partially within the outline of a bike frame.

4,099,395

TUMBLER PIN-TYPE CYLINDER LOCK

Roque Villareal Garza, Crozco y Berra 201-203, Ma. la Ribera, Mexico

Filed Apr. 13, 1977, Ser. No. 786,994
Claims priority, application Mexico, Apr. 27, 1976, 164449; Dec. 3, 1976, 167256
Int. Cl.[2] E05B *27/04*
U.S. Cl. 70—360 **6 Claims**



1. A tumbler pin-type cylinder lock comprising a housing having a cylindrical bore therein, a plurality of tumbler pin bores in the housing normal to the cylinder bore and intersecting the same, a lock cylinder mounted in the cylinder bore for controlled axial or axial and radial movement relative to the housing, a key receiving slot in the lock cylinder, cylinder control tumbler pins mounted in the tumbler pin bores, a key having a profile conforming to the tumbler pin combination and a stop member, said stop member engaging a cooperating striker on the lock cylinder for axially moving the cylinder within the cylinder bore in the housing; wherein the stop member on the key comprises a portion of the profile conforming to the tumbler pin combination and the cooperating striker on the lock cylinder comprises one of the tumbler pins.

4,099,396

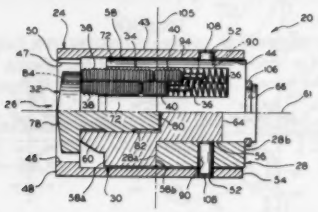
PICK-RESISTANT AXIAL SPLIT-PIN TUMBLER-TYPE LOCK MECHANISM

William J. Kerr, Madison, Wis., assignor to Chicago Lock Co., Chicago, Ill.

Filed Aug. 15, 1977, Ser. No. 824,442
Int. Cl.[2] E05B *27/08*
U.S. Cl. 70—363 **16 Claims**

1. In an axial split-pin tumbler-type lock mechanism including a lock cylinder, a barrel assembly secured within said cylinder and having a longitudinal axis extending between front and rear ends thereof, said barrel assembly including a forwardly disposed operating part rotatable about said axis and a rearwardly disposed stationary part adjoining the operating part at a transverse interfacial plane, means forming longitudinal bores in said operating and stationary parts respectively, said bores in respective parts being movable into and out of

alignment upon rotation of said operating part, tumblers each having a forwardly disposed driver element carried in one of said operating part bores and a separate rearwardly disposed follower element carried in one of said stationary part bores and the elements adjoining each other when in a pair of aligned bores, said tumblers each being reciprocally movable in the axial direction in a pair of aligned bores between positions wherein the joint between said elements thereof is disposed respectively on opposite sides of said interfacial plane, said operating part being freed for rotation when said joints coincide with said interfacial plane, and spring means yieldingly urging said tumblers in aligned bores forwardly to positions wherein said interfacial plane is bridged by said follower elements to secure the operating and stationary parts against relative rotation, said driver elements having front ends engageable with a key which when moved rearwardly moves said tumblers in aligned bores into positions wherein said joints



coincide with said interfacial plane, the improvement which comprises:

providing at least one combination of two adjacent ones of said pairs of aligned bores in longitudinal communication with each other to permit sidewise engagement of an element of a tumbler in one pair with an element of a tumbler in the remaining pair,

providing mechanical interlock means on a side surface of an element of a tumbler disposed in each of said adjacent pairs of aligned bores, said interlock means on respective elements being adapted for engagement with each other to interengage the elements,

whereby when one of said latter tumbler elements bridges said interfacial plane, application of picking torque to said operating part tends to move the elements laterally relative to each other to cause said interengagement thereof and thereby constrain the elements to move together as a unit in the axial direction.

4,099,397

SNAP-IN CYLINDER FOR DISC AND PIN TUMBLER CAM LOCKS

Robert L. Dauenbaugh, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Jun. 29, 1977, Ser. No. 811,307
Int. Cl.² E05B 9/04
U.S. Cl. 70—371 **14 Claims**

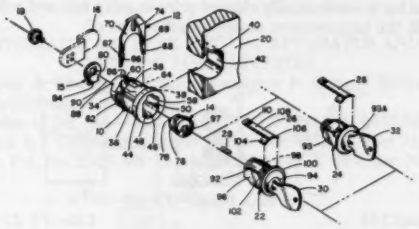
1. An improved lock assembly including a removable cylinder lock comprising, in combination:

a sleeve including a centerline axis, an inside end, and outside end and a generally cylindrical opening therethrough with a radial slot from the opening through the side of said sleeve;

a shifter in the opening rotatable about the axis of the sleeve;

a bolt attached to the shifter at the inside end of the sleeve and projecting to engage a strike;

a key operated cylinder lock positioned in the sleeve opening from the outside end including a projecting drive member for engaging and driving the shifter about the axis; and



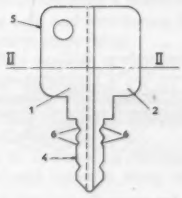
a removable, lock retainer member having one end engaged to the lock with the opposite end projecting through the radial slot and engaging the sleeve at the inside end.

4,099,398

LOCK KEY, METHOD FOR ITS MANUFACTURE AND LOCK EMPLOYING THIS KEY

Paul Lipschutz, Croissy-sur-Seine, France, assignor to Societe Neiman SA, Courbevoie, France

Continuation-in-part of Ser. No. 561,146, Mar. 24, 1975, abandoned. This application Mar. 24, 1977, Ser. No. 780,934
Claims priority, application France, Apr. 18, 1974, 74 13585
Int. Cl.² E05B 19/04
U.S. Cl. 70—406 **9 Claims**



1. A key comprising a manipulating head part and an integral lock operating part for insertion into a key receiving slot of a lock, an integral connecting part extending the full length of the key and connecting portions of said head part and said operating part on opposite sides thereof, said portions of said head and operating parts on one side of the connecting part lying in a common plane and the portions of said head and operating part on the other side of said connecting part also lying in a common plane, said integral connecting part including a longitudinally extending section disposed in a plane offset from that plane common to said portions of said head and operating parts on said one side of said connecting part, and wherein an edge of at least one of said portion of said operating part most remote from said connecting part is coded by notching and constitutes means cooperating with tumbler elments of a lock when said operating part is inserted into a key receiving slot of a lock.

4,099,399

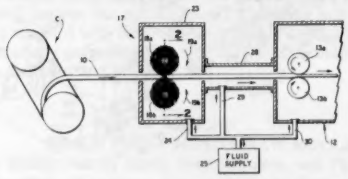
METHOD AND APPARATUS FOR PRODUCTION OF HOT-FORMED METALLIC ROD

Milton E. Berry, and Daniel B. Cofer, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation of Ser. No. 614,126, Sep. 17, 1975, abandoned. This application Jun. 16, 1977, Ser. No. 806,965
Int. Cl.² B21B 9/00, 45/04
U.S. Cl. 72—38 **10 Claims**

1. The improved method of hot-forming a metallic cast bar of the type wherein a continuous length of bar is conveyed

from a casting machine to a hot-rolling mill along a path which exposes said bar to an oxidizing atmosphere thereby forming metallic oxides on the exposed surface of said bar and wherein said bar is mechanically cleaned prior to entry into said rolling mill, the improvement comprising the steps of:



mechanically removing oxide from the surface of the bar while in a chemically reducing environment for limiting the amount of metal mechanically removed from the surface of the bar, thus minimizing mechanical damage and microporosity of the bar; and then maintaining the de-oxidized bar in a reducing environment at least until the bar is introduced into a rolling mill.

4,099,400

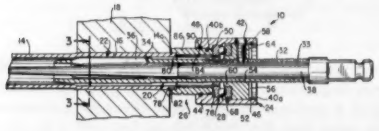
VERSATILE EXPANDING APPARATUS FOR TUBES AND THE LIKE

Donald E. Schott, Chester, Vt., assignor to Thomas C. Wilson, Inc., Long Island City, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,792

Int. Cl.[2] B21D *39/10*

U.S. Cl. 72—122 **12 Claims**



1. An apparatus for expanding an end portion of a tubular member positioned within an opening defined by an outer member, which comprises a generally elongated first housing having one end portion adapted to be rotatably inserted into the tubular member, means mounted in said housing for expanding the end portion of the tubular member outwardly in engaged relation with peripheral portions of the opening and for developing forces directed axially into the tubular member, a second housing adapted to be securedly positioned along pre-selected locations of said first housing and having at least a first open end portion positioned to face said outer member and the end portion of the tubular member, a reversible collar member having first and second free end portions adapted to be removably positioned within the opening of said second housing in at least one of two positions, the first position wherein the first free end portion is configured to be engaged at least with said outer member in a manner to permit the tubular member to be expanded so as to extend a predetermined distance outwardly of the said outer member and a second position wherein the second free end portion is configured to be engaged at least with said outer member to retain the end of the tubular member substantially continuous with surface portions of said outer member, means positioned within said second housing for engageably rotatably supporting said collar member to provide reaction forces to said collar member in a generally longitudinal direction with respect to said first housing during rotation thereof so as to maintain the preselected relation between said tubular member and said outer member as determined by the configuration of the free end portion of said reversible collar in any given position, and resilient means positioned within said second housing and being adapted to releasably retain either of said end portions of said reversible collar within said second housing for permitting said collar to be releasably installed and removed in response to generally axially directed forces.

4,099,401

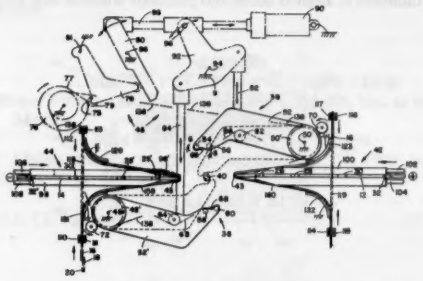
METHOD OF PRODUCING SPIRALLY WOUND ELECTROCHEMICAL CELLS

Leonard F. Hug, Wheatridge; Donald H. McClelland, Littleton, and Toshio Uba, Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 810,336, Jun. 27, 1977, which is a division of Ser. No. 733,674, Oct. 18, 1976, Pat. No. 4,064,725. This application Dec. 16, 1977, Ser. No. 861,157

Int. Cl.[2] B21C *47/12*

U.S. Cl. 72—147 **5 Claims**



1. A method for spirally winding electrode plates and separators into a cylindrical cell pack subassembly for inclusion in an electrochemical cell, comprising:

disposing in juxtaposition first and second retractable winding heads each carrying a driving surface for winding the electrode plates and separators into spiral form;

positioning a mandrel intermediate the winding heads and opposite each of the driving surfaces;

feeding a leading edge of one of the electrode plates, adjacent which is disposed at least one separator layer, in between the mandrel and the driving surface of the first winding head;

feeding a leading edge of the other electrode plate, adjacent which is disposed at least one separator layer, in between the mandrel and the driving surface of the second winding head;

locking the winding heads into winding position by advancing the winding heads toward one another and by sandwiching the plates and separators between each of the driving surfaces and mandrel; and

driving at least one of the driving surfaces while simultaneously retracting the winding heads away from one another whereby the spirally wound cell pack is formed.

4,099,402

STRETCH REDUCING OF HOLLOW STOCK

Horst Biller, Kettwig, Fed. Rep. of Germany, assignor to Mannesmannrohren-Werke, A.G., Dusseldorf, Fed. Rep. of Germany

Filed Jun. 21, 1976, Ser. No. 697,976

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1975, 2528883

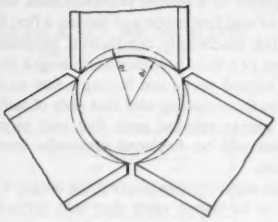
Int. Cl.[2] B21B *17/14*

U.S. Cl. 72—234 **2 Claims**

2. Method of stretch reducing pipes in a multiple stand rolling mill, comprising the steps of:

using three grooved rolls per stand with largest radius *a* and smallest radius *b* of each groove relative to a roll axis, whereby a ratio *a/b* from stand to stand for the major

reduction passes changes by less than 0.4% and the difference between the largest and smallest values for the contact squeezed length in each pass remains below a particular value.

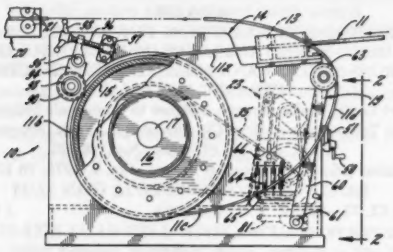


4,099,403

IN-LINE WIRE DRAWING MACHINE

Richard A. Alcock, and Robert M. Guthrie, both of Rockford, Ill., assignors to Rockford Manufacturing Group, Inc., Rockford, Ill.

Filed Feb. 28, 1977, Ser. No. 772,522
Int. Cl.[2] B21C *1/12*
U.S. Cl. 72—288 **6 Claims**



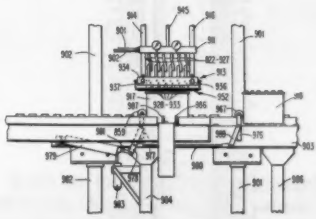
1. Apparatus for drawing a length of wire through a die and for supplying the wire to a using station, and apparatus comprising a support, a drum rotatably mounted on said support, said drum having an entrance end portion for receiving the wire from the die and having an exit end portion from which the wire is supplied to the using station, there being a coil of wire wrapped around said drum between said entrance and exit end portions with said coil being composed of a number of wraps in a single layer, a variable speed drive mechanism for rotating said drum thereby a draw wire onto said entrance end portion and to supply wire off of said exit end portion, said drive mechanism comprising a motor, an input pulley connected to be rotated by said motor, an output pulley connected to rotate said drum, and an endless belt connected between said pulleys to transmit rotation from said input pulley to said output pulley, each of said pulleys being adjustable in effective diameter and being operable when adjusted to change the speed of said output pulley and said drum, means for enabling the effective diameters of said pulleys to be manually adjusted so as to cause said drum to rotate at a selected speed, a sensing arm pivoted on said support and engaging the wire being supplied from the exit end portion of said drum to said using station in such a manner as to form such wire into a loop, said arm increasing the size of said loop when pivoted in one direction and permitting the size of said loop to decrease when pivoted in the opposite direction, means for biasing said arm in said one direction, and means connected between said arm and at least one of said pulleys and operable to change the effective diameters of said pulleys to decrease the speed of said drum when said arm pivots in said one direction and to increase the speed of said drum when said arm pivots in said opposite direction.

4,099,404

AUTOMATIC AIR LEAK TESTING APPARATUS AND METHOD FOR BATTERIES

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Division of Ser. No. 605,271, Aug. 18, 1975, Pat. No. 4,010,840, which is a continuation-in-part of Ser. No. 475,273, May 31, 1974, Pat. No. 3,938,368. This application Jun. 2, 1976, Ser. No. 692,165
Int. Cl.[2] G01M *3/26*
U.S. Cl. 73—45.2 **14 Claims**



1. Automatic leak testing apparatus for leak testing battery cells in batteries having different longitudinal dimensions by periodically coupling and decoupling a nozzle assembly with said battery cells and introducing a predetermined amount of gas into said battery cells and monitoring the gas pressure in said cells, said apparatus comprising:

(a) a nozzle assembly movable to mate with at least one cell outlet of a battery,

(b) first conveyor means for longitudinally advancing said batteries, including a position for coupling said nozzle assembly to one of said batteries,

(c) sensing means for determining the longitudinal advancement of one of said batteries along said first conveyor means,

(d) stop means for isolating said one of said batteries and precluding the remainder of said batteries from interfering with the testing process, said stop means acting in response to the determination of said sensing means,

(e) means for sensing the longitudinal dimension of said one of said batteries, and

(f) said stop means thereby moving said one of said batteries to said position for coupling said nozzle assembly to one of said batteries in automatic response to said means for sensing the longitudinal dimension of said one of said batteries.

4,099,405

APPARATUS AND METHOD FOR TESTING PIPES FOR LEAKS, AND SEALS THEREFOR

Thomas D. Hauk, Huntington Beach, and Ernest D. Hauk, Signal Hill, both of Calif., assignors to Service Equipment Design Co., Inc., Signal Hill, Calif.

Filed Dec. 12, 1975, Ser. No. 640,190
Int. Cl.[2] G01M *3/28*; F17D *3/04*
U.S. Cl. 73—46 **59 Claims**

1. Apparatus for detecting leaks in joints in pipe sections, which comprises:

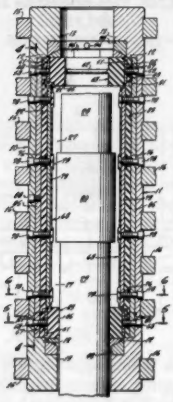
(a) casing means adapted to open for lateral reception of a jointed pipe section, and then to close to define a chamber around at least one joint in said pipe section,

(b) means to lock said casing means in closed condition,

(c) means to seal said chamber without the necessity of employing a packer therein,

said seal means including a longitudinal strip seal for

sealing a longitudinal joint between opposed regions of said casing means when the latter is in closed condition, said strip seal having a rubber body adapted to be deformed in response to closing of said casing means, and to be further deformed in response to creation of high fluid pressures within said chamber, said rubber body of said longitudinal strip seal having molded therein substantially non-deformable insert means adapted to cooperate with said longitudinal strip seal in sealing very high fluid pressures in said chamber,



said seal means further, including end seal means provided around said pipe section at the ends of said chamber to prevent escape of high-pressure fluid longitudinally of said pipe section,

(d) means to create a very high fluid pressure in said sealed chamber, and

(e) means to indicate a reduction in the fluid pressure in said chamber, thus indicating the presence of a leak in a joint in said pipe section.

4,099,406

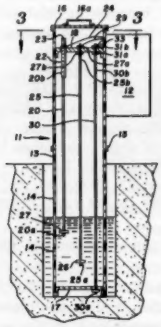
DEVICE FOR AUTOMATICALLY TESTING FLUID ABSORPTION RATES OF SOIL

Melvin A. Fulkerson, Burnsville, Minn., assignor to Hammer Industries Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 630,405, Nov. 10, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 774,922

Int. Cl.² G01N *5/02*

U.S. Cl. 73—73 **13 Claims**



1. A device for timing fluid absorption into soils to establish a rate of absorption, said device including:

a. a first, electrically conductive, longitudinally extending probe, of a first predetermined length and having a first and a second end;

b. a second, electrically conductive, longitudinally extending probe, of a second predetermined length shorter than that of said first probe and having a first and a second end;

c. a third, electrically conductive, longitudinally extending probe, of a third predetermined length shorter than that of said second probe and having a first and a second end;

d. means for mounting said first ends of said probes in generally planar relation such that said second ends of said probes will be displaced unequally from said mounting means;

e. means supporting said mounting means with respect to the soil to be tested such that said probes may extending downwardly into a test hole into the soil to be tested;

f. a first timing means connected to said first and third probes and controlled by the conductivity therebetween for actuation of said first timing means in response to conduction between said probes provided by fluid within the test hole; and,

g. a second timing means connected to said first and second probes and controlled by the conductivity therebetween for actuation of said second timing means in response to conduction between said probes provided by fluid within the test hole.

4,099,407

METHOD FOR MEASURING THE PRE-STRESS IN HOOP-BOUND ANULUSES OF RECTANGULAR CROSS-SECTION AND MADE OF PIEZOELECTRIC CERAMIC MATERIAL

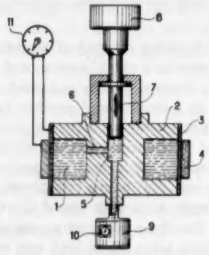
Henri Louit, Toulon, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed May 19, 1977, Ser. No. 798,720

Claims priority, application France, Jun. 9, 1976, 76 17453

Int. Cl.² G01N *3/36;* G01R *29/22;* G01N *33/38*

U.S. Cl. 73—88.5 R **1 Claim**



1. A method for measuring the pre-stress in a hoop-bound annulus having a rectangular cross-section and made of piezoelectric ceramic material, said method comprising the steps of:

applying a pressure stress on the internal cylindrical surface of said annulus, said pressure stress having a main continuous component and a subsidiary sine-shaped component,

varying the main continuous component while keeping the maximum amplitude of said subsidiary sine-shaped component at a constant value, said main continuous component assuming several values,

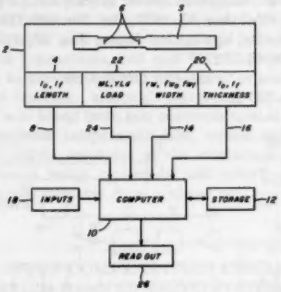
and measuring the sinusoidal electric voltage generated across the annulus by the subsidiary component of said pressure stress for each value of the main continuous component, whereby, the main continuous pressure stress component which corresponds to the maximum value of said voltage is a measure equal, in absolute value, of the pre-stress due to binding.

4,099,408

METHOD FOR TESTING SHEET METALS

David C. Ludwigson, Hempfield Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 5, 1977, Ser. No. 812,974
Int. Cl.[2] G01N 3/08
U.S. Cl. 73—95 16 Claims



1. A method for tensile testing a sheet metal specimen comprising the steps of

preparing the specimen to have a reduced width portion for a part of the specimen length to be tested, thereby defining a full width section and a reduced width section,

measuring the widths of the reduced width section and the full width section and the thickness of the specimen,

straining the specimen to failure,

measuring the thickness and width of the full width section, and

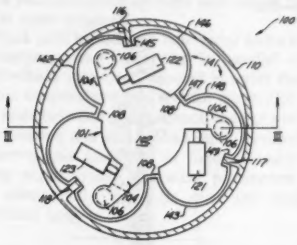
calculating the strain hardening exponent of the sheet metal from the thickness and width measurements.

4,099,409

MULTI-AXIS LOAD CELL WITH ARCUATE FLEXURES

James Junior Edmond, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 5, 1977, Ser. No. 812,966
Int. Cl.[2] G01L 5/16
U.S. Cl. 73—133 R 12 Claims



1. A multi-axis load cell comprising:

a housing;

a hub disposed in said housing;

means for connecting said housing and said hub and for receiving and transmitting a load applied to said hub or said housing, said means including a plurality of one-piece flexures, each of the flexures having two ends, each end fixed to one of said housing and said hub, and each flexure has a medial portion coupled to the other of said housing and hub whereby a load applied to the hub or housing causes a displacement thereof by the movement of the connecting means, said displacement being related to the magnitude of the load applied; and

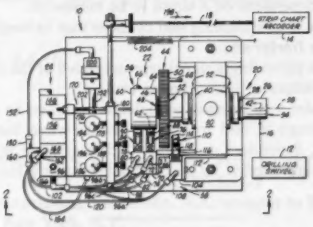
means for measuring the relative displacement between said housing and said hub and generating signals corresponding thereto, said measuring means mounted to one of said housing and said hub and engaging the other of said housing and said hub, whereby the load exerted through said flexures may be determined, said measuring means including a first set of transducers arranged in pin-wheel fashion about an axis of the load cell and a second set of transducers extending parallel to and about said load cell axis, all of said transducers in the first and second sets engaging the other of said hub and housing at points thereon in a substantially common plane.

4,099,410

RATE OF PENETRATION RECORDER

T. Edward Martin, Oklahoma City, Okla., assignor to Arthur J. Connelly, Farmington, N. Mex., a part interest

Filed Sep. 26, 1977, Ser. No. 836,409
Int. Cl.[2] E21B 45/00
U.S. Cl. 73—151.5 10 Claims



1. In a rate of penetration recorder having a primary shaft portion connected to a drilling swivel, the primary shaft portion rotating once in a first direction about the longitudinal axis thereof in response to the vertically downward movement of the drilling swivel a predetermined penetration distance, the improvement comprising:

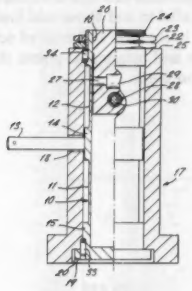
sensor means, including a portion connected to the primary shaft portion of the recorder and responsive to the rotation thereof, the sensor means providing a set signal in response to the rotation of the primary shaft portion in the first direction to a predetermined set position, and providing a reset signal in response to the rotation of the primary shaft portion in the first direction to a predetermined reset position, the reset position being displaced from the set position a predetermined number of degrees of rotation of the primary shaft portion in the first direction; and,

circuit means connected to the sensor means and being selectively positionable in mutually exclusive set and reset states, the circuit means receiving the set and reset signals, being positioned in the set state in response to receiving the set signal while positioned in the reset state, and being positioned in the reset state in response to receiving the reset signal while positioned in the set state, the circuit means providing a step-penetration signal indicative of the vertically downward movement of the drilling swivel the penetration distance in response to being positioned in the set state.

4,099,411
STRAIN MEASUREMENT

George Albert Woolvet, Kingston-upon-Thames, and Bryan Peter Tolley, Humberside, both of England, assignors to National Research Development Corp., London, England

Filed Mar. 23, 1977, Ser. No. 780,337
Claims priority, application United Kingdom, Mar. 24, 1976, 11851/76
Int. Cl.² G01L 1/10
U.S. Cl. 73—141 R 14 Claims

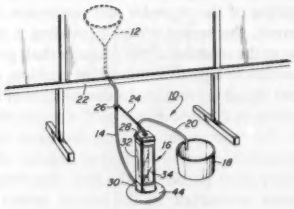


14. Apparatus for strain measurement, comprising:
a cylinder;
exciting means for vibrating the wall of said cylinder;
loading means for longitudinally straining said cylinder wall by applying torsion to the cylinder, the applied torsion being dependent on a strain to be measured;
means for so constraining said cylinder that its length cannot change freely; and
means for providing a signal representative of the frequency of vibrations of said cylinder wall,
the cylinder wall being of a thickness such that an appreciable change in said frequency occurs when longitudinal strains, dependent on strains within a range to be measured, are applied to said cylinder wall by said loading means.

4,099,412
METHOD OF MEASURING THE INSTANTANEOUS FLOW RATE OF URINE DISCHARGE

John Nehrbass, 4793 Lake Valley Dr., Lisle, Ill. 60532

Filed Jun. 17, 1977, Ser. No. 807,594
Int. Cl.² G01F 1/24
U.S. Cl. 73—209 5 Claims

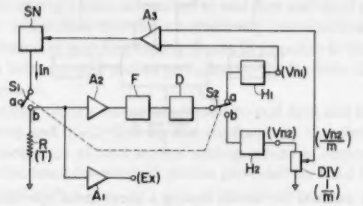


1. A method of measuring the instantaneous flow rate of a urine discharge from a patient, comprising the steps of
connecting one end of a conduit to the inlet of a rotameter having an inlet at the bottom and an outlet at the top,
positioning the other end of said conduit at a location above the outlet of said rotameter,
filling said conduit and said meter with an aqueous solution until the level of said solution in said conduit is at the same height as said outlet, and then
causing said discharge to flow freely into said conduit during the voiding of urine by said patient,
whereby said rotameter indicates the instantaneous flow rate of said discharge.

4,099,413
THERMAL NOISE THERMOMETER

Akira Ohte, and Makoto Imamura, both of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Jun. 13, 1977, Ser. No. 805,729
Claims priority, application Japan, Jun. 25, 1976, 51-75223; Jun. 25, 1976, 51-75225
Int. Cl.² G01K 7/30
U.S. Cl. 73—359 R 10 Claims



1. A thermal noise thermometer based on the principle that the magnitude of thermal noise signal produced in the resistor is a function of the temperature of the resistor, comprising:
means to develop a shot noise signal;
switch means to interruptedly apply said shot noise signal to said resistor;
voltage-responsive means coupled to said resistor for producing output signals responsive to the voltage thereof in the different conditions of said switch means; and
means coupled to the output of said voltage-responsive means for producing a measurement signal representing the temperature of said resistor.

4,099,414
AUTOMATIC RELEASE HOSPITAL THERMOMETER

Jon L. Krahmer, 511 E. Second, Fairmont, Minn. 56031

Filed May 19, 1977, Ser. No. 798,430
Int. Cl.² G01K 5/06, 1/14
U.S. Cl. 73—373 10 Claims

1. In a clinical thermometer in which a thermometric liquid expands and contracts to give a meniscus which moves linearly in a stem with respect to fixed temperature graduations thereon:
an elongated tube of transparent material characterized by a first temperature coefficient of expansion, and having a capillary bore connected at one end to a closed reservoir for liquid;

temperature correlated graduations disposed in a scale along a first portion of said tube in contiguity to said bore;

valve means including a member movable with respect to said tube between a normal position, in which limited passage is provided between said reservoir and said bore, and an actuated position in which substantially free passage is enabled between said reservoir and said bore;

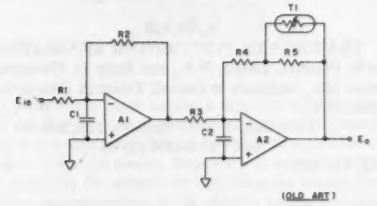
and a liquid in said reservoir having a greater coefficient of thermal expansion than said transparent material, the quantity of said liquid being such that as the ambient temperature rises within a predetermined range said liquid expands out of said reservoir into said bore in contiguity with said graduations, and said limited passage being so small as to prevent unaided movement of said liquid back into said reservoir, although permitting expansive movement of said liquid from said reservoir to said bore, so that as the ambient temperature falls, within said range, the body of liquid separates at the restricted passage said valve means being located in said reservoir and being magnetically actuable from without said reservoir.

4,099,415

TEMPERATURE COMPENSATION CIRCUIT FOR A FLUID DAMPED SERVO SYSTEM

Robert Eugene Hartzell, Jr., Pittsburg, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed Sep. 1, 1977, Ser. No. 829,774
Int. Cl.[2] G01P *15/08*; G01D *11/12*
U.S. Cl. 73—497 **3 Claims**



1. A temperature compensation circuit for a fluid damped servo system operating within a predetermined temperature range, comprising

a single operational amplifier having first and second input terminals and an output terminal,

an input resistor connected to said first input terminal,

a feedback path extending between said output terminal and said first input terminal,

said feedback path including a thermistor and a temperature gain change resistor connected in parallel combination and a feedback resistor connected in series therewith,

and a room temperature gain resistor connected between a circuit node between said feedback resistor and said parallel combination and said second input terminal,

so that servo gain increases as fluid viscosity increases, whereby servo system operating parameters are maintained substantially the same over the predetermined temperature range.

4,099,416

RESOLUTION REAL-TIME ULTRASONIC IMAGING APPARATUS

Ludwig Niklas, Lovenich, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

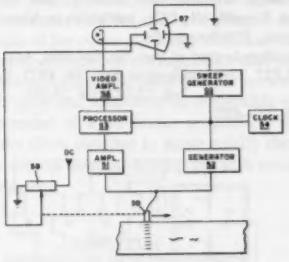
Filed Apr. 25, 1977, Ser. No. 790,407
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—602 **14 Claims**

1. An apparatus for improving the resolution of a real-time ultrasonic imaging system comprising:

electroacoustic probe means adapted to be acoustically coupled to a workpiece;

energizing means coupled to said probe means for causing said probe means to periodically transmit an ultrasonic energy search signal in the workpiece and to receive echo signals therefrom and to convert said echo signals into electrical signals;

receiver means coupled to said probe means for receiving said electrical signals and providing respective discrete echo amplitude signals (f_k) responsive to said electrical signals, wherein k is an integer and each signal f_k is commensurate with a depth increment in the workpiece;



processor means including storage means for storing a sequence of acoustic beam profile values (d_n) commensurate with the characteristics of said probe means coupled to said receiver means for sequentially receiving said amplitude signals (f_k), associating respective stored beam profile values (d_n) with amplitude signals (f_k) and providing a sequence of output signals b_l commensurate with the equation:

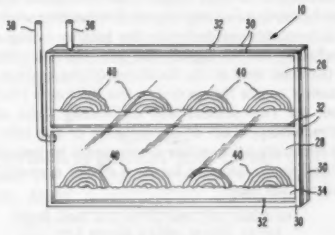
$$b_l = \sum_k d_n \cdot f_k .$$

4,099,417

METHOD AND APPARATUS FOR DETECTING ULTRASONIC ENERGY

Stanley Shwartzman, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 25, 1977, Ser. No. 800,277
Int. Cl.[2] G01H *3/10*
U.S. Cl. 73—606 **10 Claims**



7. A method of detecting the energy level of a beam of ultrasonic energy being propagated through a fluid comprising:

filling a chamber partially with a liquid, said chamber having two sides separated by a spacing no greater than about 25 millimeters and having a transparent section allowing for visual observation of the height of said liquid therein, the liquid having a viscosity lower than water and being disposed within said chamber so that the free surface of the liquid intersects said two sides, the sides having a width and height significantly greater than said spacing, and

positioning said chamber in said fluid so that said beam of energy strikes said liquid at the surface thereof from a direction substantially parallel to the plane of said free surface, whereby said beam generates a visible arc-shaped spray having an amplitude proportional to the energy level of said beam.

4,099,418

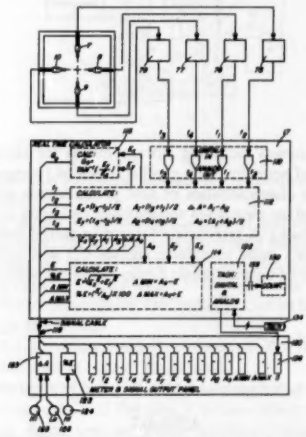
SYSTEM FOR DETERMINING TUBE ECCENTRICITY

Robert F. Bennett; Nicholaas L. Brouwer, both of Allegheny Township, Westmoreland County, and David M. Stricker, Lower Burrell, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 564,056, Apr. 1, 1975, Pat. No. 4,027,527. This application Feb. 28, 1977, Ser. No. 772,529

Int. Cl.² G01N *29/04*

U.S. Cl. 73—622 **2 Claims**



1. Apparatus for continuously determining eccentricity of the wall of a tube when the average wall thickness of the tube is known, the apparatus comprising

a frame,

two sensors mounted on said frame for sensing the thickness of the wall of said tube, said sensors being supported by the frame adjacent the tube wall at two spaced locations with respect to each other, with the axes of the two sensors extending radially of and intersecting within the tube at a predetermined angle, the sensors being capable of producing output signals that are related to the thickness of the tube wall at the locations of the sensors and,

processing means for receiving the thickness related signals from the two sensors and translating these signals into vector components of eccentricity of the tube wall, and for summing said vector components to provide a signal related to the angular location of the eccentricity of the wall of said tube.

4,099,419

ULTRASONIC TOMOGRAPHY APPARATUS

Masao Kuroda, Tokyo; Toshio Kondo, Kunitachi; Toshio Ogawa, Kokubunji, and Sekijyuro Ono, Hachioji, all of Japan, assignors to Hitachi Medical Corporation, Japan

Filed Mar. 1, 1977, Ser. No. 773,171

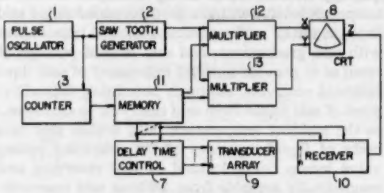
Claims priority, application Japan, Mar. 5, 1976, 51-23276

Int. Cl.² G01N *29/00*

U.S. Cl. 73—626 **7 Claims**

1. In an ultrasonic tomography apparatus of an electronic scanning type in which an array of ultrasonic transducer elements are excited with desired time delays allotted for the individual transducer elements thereby to transmit and receive ultrasonic beams at a deflection angle corresponding to said time delays, the received echo signal of said ultrasonic beams being displayed on a display means in a form of a tomograph of a sample to which said ultrasonic beams are directed,

the improvement comprising a memory means for previously storing therein first signals representing the time delays selectively allotted for said individual transdúcer elements in dependence on given deflection angles and



second signals commanding display position on said display means, and a data accessing means for reading out said first and second signals corresponding to a desired deflection angle from said memory means, said signals read out through said data accessing means being utilized to provide said time delays for said transducer elements upon excitation thereof and to display said received echo signal on said display means.

4,099,420

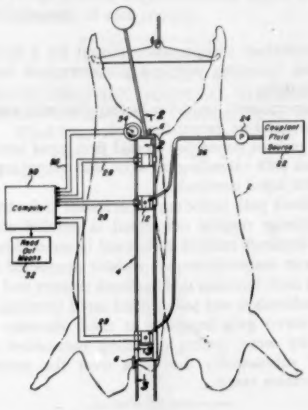
TRANSDUCER POSITIONING APPARATUS

James R. Stouffer, Ithaca, N.Y., and Rudy G. Westervelt, Florissant, Mo., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,260

Int. Cl.² G01N *29/00*

U.S. Cl. 73—629 **7 Claims**



1. In an ultrasonic carcass inspection apparatus including at least one sonic transducer for inspecting an animal carcass that is supported by its hind legs,

the improvement which comprises

vertical frame means for mounting the sonic transducer adjacent the skin side of the carcass, said frame means including

(a) a pair of telescopically connected sections that are relatively vertically slidably displaceable between expanded and retracted positions, respectively;

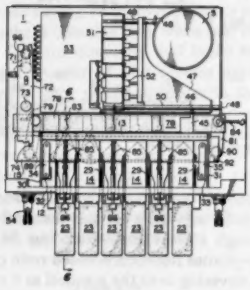
(b) spring means biasing said frame sections toward their retracted positions, respectively;

(c) means for mounting the sonic transducer on one of said sections;
(d) first hook means for connecting one of said frame sections with the tail portion of the carcass; and
(e) second hook means for connecting the other of said frame sections with the jowl-shoulder junction of the carcass.

4,099,421
PUSHBUTTON TUNER

Tamaki Ohashi; Shigemasa Shosakai; Shohei Yamagishi, and Kunihiro Taniguchi, all of Tokyo, Japan, assignors to Nihon Technical Kabushiki Kaisha, Japan

Filed Apr. 2, 1976, Ser. No. 673,119
Claims priority, application Japan, Apr. 5, 1975, 50/40811
Int. Cl.[2] F10H *35/18*
U.S. Cl. 74—10.33 **10 Claims**

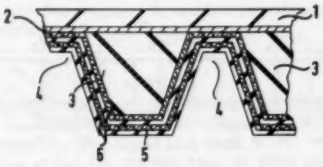


1. In a pushbutton tuner having a support; a tuning element mounted on the support to establish a tuning frequency and including a movable part which is movable to a position corresponding to a desired tuning frequency; a manually rotatable actuator assembly for selectively adjusting the tuning element to a position corresponding to the desired tuning frequency; a clutch assembly for normally operatively connecting the manually rotatable actuator assembly with the tuning element; a plurality of presettable pushbutton actuator assemblies each operable to selectively adjust the tuning element to a position corresponding to a particular tuning frequency that is different from the tuning frequency established by any of the remaining pushbuttons; and clutch trip means for releasing the connection between the manually rotatable actuator assembly and the tuning element in response to operation of any one of the pushbutton actuator assemblies: the improvement wherein each of the pushbutton actuator assemblies comprises a slide mounted on the support so as to be slidably movable between a forward inoperative position and a rearward operative position and normally biased into the inoperative position, a control member pivotally mounted on the slide and being adjustably positionable relative thereto and having an upstanding pin mounted thereon, a preset member for releasably locking the control member to the slide, and a pushbutton carried by the preset member and having a forward end of the slide slidably received therein; the pushbutton actuator assemblies being disposed in a direction transverse to the movable part of the tuning element, the movable part being formed by a flat plate having formed therein a plurality of V-shaped notched cam edges each of which is associated with the respective pushbutton actuator assemblies and in each of which is located the upstanding pin of the control member so that movement of a particular pushbutton actuator assembly to its operative position causes the movable plate to be adjusted to a position corresponding to a particular frequency which is determined by the positioned control member; the pushbutton actuator assemblies being disposed in two sets, each set being disposed in a complementary manner on the opposite side of the movable plate from the other set such that each of the notched cam edges defines a recess formed in the movable plate and opening to the same side as the corresponding pushbutton actuator assembly, and each of the pushbutton actuator assemblies being arranged so that the upstanding pin on the control member carried thereby is located within the associated cam edge in the movable plate; said clutch trip means including a shift member which extends substantially parallel to the movable plate and mounted on the support so as to be movable in the lengthwise direction thereof, a plurality of cams on said shift member each associated with one of the pushbutton actuator assemblies, and a plurality of drive members each associated with one of the pushbutton actuator assemblies and each extending in the same direction as the slide of the corresponding pushbutton actuator assembly and slidably mounted on the support so that normally its one end is in bearing relationship with the rear surface of the pushbutton and its other end located to be engageable with the cam so that movement of a particular pushbutton actuator assembly causes the drive member to move axially thereof as the pushbutton is moved thereby driving the shift member to trip the clutch assembly.

4,099,422
OIL RESISTANT TOOTHED BELT

Mario Cicognani, Milan, and Bruno Mirabelli, Varese, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Nov. 15, 1976, Ser. No. 742,073
Claims priority, application Italy, Dec. 5, 1975, 30002 A/75
Int. Cl.[2] F16G *1/00*
U.S. Cl. 74—231 C **4 Claims**



4. A toothed belt comprising an elastomeric continuous band, a reinforcing structure embedded in said band, a toothing on at least one face of the band and a covering for the toothing constituted by at least two layers of fabric doubled together with a layer of elastomeric material interposed therebetween, said covering being an extremely rigid layer which is substantially non-deformable by flexion stresses in comparison with the elastomeric or plastic material forming the toothing, said band, toothing and covering being an elastomeric composition which is resistant to hot oil.

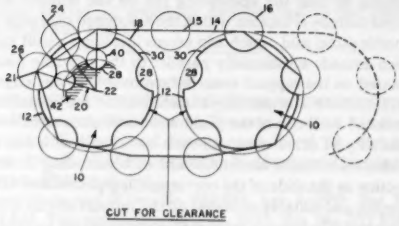
4,099,423
COMPATIBLE SPROCKET AND CHAIN SYSTEM

Max Mullins, c/o Nel Mullins, 13700 N.E. Miami Court, Miami, Fla. 33161

Filed Jun. 21, 1977, Ser. No. 808,470
Int. Cl.[2] F16H *55/30;* F16G *13/02*
U.S. Cl. 74—243 R **3 Claims**

1. A compatible sprocket and chain system wherein each sprocket (18) has an odd number of teeth (30), there being a minimum of five teeth, and the chain (14) has an odd number of links (15) and rollers (16), there being a minimum of nine links (15) and rollers (16), wherein the shape of the sprocket of the sprocket is set up with twice the number of circles, as the desired number of sprocket teeth (12), the circles (26) being arranged circumferentially and contacting each other on a sprocket blank (18), then cutting into the blank the recesses (28) provided by alternate circles (26) and discarding the intermediate circles, the chain (114) having link rollers (16) of the

same radius as the cut-in recesses (28) of the sprocket blank (18), the sprocket edge being cut away a reasonable distance,



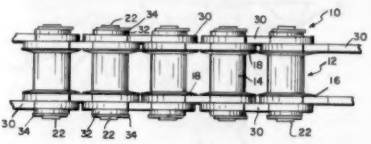
between the recesses, to permit clearance of the link rollers (16).

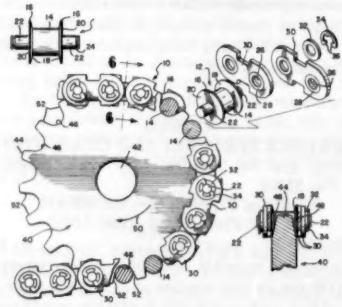
4,099,424

CHAIN DRIVE

Robert E. Pemberton, R.R. #2, Box 123, Edinburg, Ind. 46124

Filed Jun. 24, 1976, Ser. No. 699,463
Int. Cl.[2] F16G *13/06, 15/12*
U.S. Cl. 74—251 R 19 Claims





1. A drive chain comprising a plurality of one-piece roller links each having a cylindrical central roller with a generally circular cross section and a pair of journals extending outwardly from the opposed ends thereof and axially aligned with said central roller; a plurality of side plates each having a pair of journal-receiving holes provided therein, said side plates being mounted in an overlapping, staggered fashion on the journals of adjacent roller links to form the drive chain; and means for retaining said side plates on said journals.

8. A drive chain as set forth in claim 1 wherein each of the journal-receiving holes in each of said side plates has a self-lubricating bushing carried therein, said self-lubricating bushing having an opening formed therein for receiving one of said journals.

4,099,425

METHOD OF MAKING PUSH-PULL CABLE CONDUIT AND PRODUCT

Bruce H. Moore, Kent, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio

Filed Jun. 1, 1976, Ser. No. 691,499
Int. Cl.[2] F16C *1/10*
U.S. Cl. 74—501 P 20 Claims

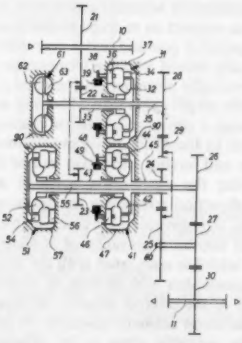
1. The method of making a push-pull cable conduit comprising continuously moving a tubular mandrel core of flexible material through a cross head extruding die, forming a thin tape of micro-porous fluorocarbonated resin continuously into a cylindrical covering over the mandrel as it enters the extruding die, extruding an outer layer of polymeric material over the cylindrical covering in the presence of heat to bond said material to said covering by penetration of said material into the pores of the covering, and subsequently removing the mandrel core.

4,099,426

HYDRODYNAMIC TRANSMISSION FOR VEHICLES

Rolf Keller, and Erich Polzer, both of Heidenheim, Brenz, Fed. Rep. of Germany, assignors to Voith Getriebe KG, Heidenheim, Brenz, Fed. Rep. of Germany

Filed Aug. 19, 1976, Ser. No. 715,981
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1975, 2537431
Int. Cl.[2] F16H *47/00;* F16D *33/00, 67/04;* B60K *41/26*
U.S. Cl. 74—730 11 Claims



1. In a transmission, particularly in a transmission for vehicles, a combination comprising rotary input means; reversible rotary output means; forward and reverse drive trains each including an adjustable starting fluid flow converter, a first

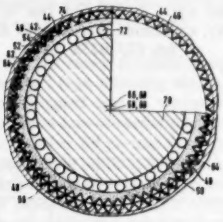
mechanical power train common to and connecting said converters with said input means and a second mechanical power train connecting said converters with said output means, said converters being closely adjacent to each other and each thereof comprising a rotary primary element and a rotary secondary element, said first power train comprising a first gear train connecting said primary elements to each other and said second power train comprising a second gear train connecting said secondary elements to each other, said forward drive train further including a cruising fluid flow converter coaxial with the starting converter of said forward drive train and having a discrete secondary element which is coaxial with the secondary element of the starting converter of said forward drive train, each of said converters comprising a working circuit which is rendered operative in response to admission of working fluid and ineffective in response to evacuation of working fluid; a third power train connecting the secondary element of said cruising converter with said output means; a hydrodynamic brake having an annulus of blades in such orientation that said brake is effective only when said output means is rotated in the forward direction, said brake being coaxial with the starting converter of said reverse drive train and further comprising a rotor which rotates with the secondary element of said last mentioned starting converter; means for actuating said brake when the RPM of said output means exceeds a predetermined value; and means for evacuating working fluid from said cruising converter, said actuating means comprising means for operating said evacuating means simultaneously with actuation of said brake when said output means is rotated by said cruising converter.

4,099,427

PLANETARY GEARING

Kurt Gerhard Fickelscher, Frankenthal, Germany, assignor to Balcke-Durr AG, Ratingen, Germany

Filed Oct. 12, 1976, Ser. No. 731,532
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545681; Nov. 14, 1975, 2551083; Apr. 24, 1976, 2617951
Int. Cl.² F16H *1/28*
U.S. Cl. 74—804 44 Claims



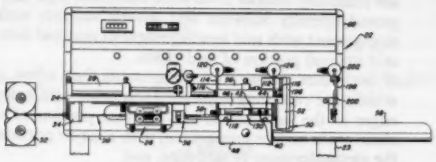
1. Planetary gearing comprising a toothed planet gear, a pair of toothed central gears meshing with said toothed planet gear said central gears being of similar construction except that they have a respectively different number of teeth forming virtual tooth rows one with the other, and a cam disc rotatable about an axis and operatively connected with said toothed planet gear for guiding and driving the same, all of said gears having teeth of substantially triangular cross section and flat tooth flanks, each of said virtual tooth rows having tooth gap points disposed on a closed virtual addendum curve having a center of mass located on said axis of rotation of said cam disc, said teeth of said planet gear flatly engaging on both sides thereof the flanks of at least one of said virtual tooth rows, said one virtual tooth row having a pitch equal to that of the tooth row of said planet gear so that, in a limiting case, all of the teeth except for the difference in the numbers of teeth of the central gears are in force-transmitting engagement.

4,099,428

CUTTING AND INSULATION STRIPPING APPARATUS FOR TWISTED WIRE PAIR

Robert B. Senior, Grand Haven, and Frederick Karasinski, Grand Rapids, both of Mich., assignors to Gardner-Denver Company, Dallas, Tex.

Division of Ser. No. 656,239, Feb. 9, 1976, Pat. No. 4,043,362.
This application May 25, 1977, Ser. No. 800,499
Int. Cl.² H02G *1/12*
U.S. Cl. 81—9.51 11 Claims



1. An insulation cutting mechanism for cutting the insulation of each wire of a wire pair comprising:

a pair of opposed insulation cutting blades disposed substantially for reciprocating movement toward and away from each other between open and closed positions;

actuator means for moving said insulation cutting blades toward and away from each other;

a first pair of cams disposed for movement to engage the wires of said wire pair for moving said wires toward a position for cutting the insulation by said insulation cutting blades; and

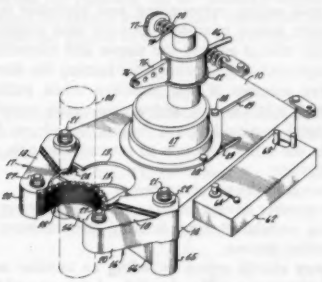
a second pair of cams movable with respect to said first pair of cams for engaging said wires sequentially after said wires have been engaged by said first pair of cams to move said wires further toward said position.

4,099,429

PIPE-SPINNING APPARATUS AND METHOD

Ernest D. Hauk, Signal Hill, Calif., assignor to Service Equipment Design Co., Inc., Signal Hill, Calif.

Continuation of Ser. No. 238,069, Mar. 27, 1972, abandoned.
This application Sep. 22, 1975, Ser. No. 615,597
Int. Cl.² B25B *13/52*
U.S. Cl. 81—57.17 23 Claims



1. Apparatus for spinning pipe, which comprises:

(a) first and second sprocket wheels,

(b) a chain,

said chain being a closed loop having an external portion and also having an inverse internal portion disposed within said external portion,

said external and internal chain portions connecting to each other at return-bent portions which are respectively meshed with said first and second sprocket wheels and bend therearound,

said chain having a large number of leaf-links the end portions of which are pivotally connected to the end portions of adjacent links,

each of said leaf-links having teeth on one side thereof adapted to mesh with said sprocket wheels,

each of said leaf-links having an elongated bearing edge on the other side thereof adapted to engage the exterior surface of a pipe to be spun,

(c) means to effect relative movement between the axes of said sprocket wheels to thereby cause said wheels to be either relatively remote from each other or relatively adjacent each other,

said last-named means being such that when said wheels are relatively remote from each other said pipe may be passed laterally between said wheels and into surface engagement with said bearing edges of said leaf-links in said internal portion of said chain,

said last-named means also being such that when said wheels are relatively adjacent each other said bearing edges of the leaf-links in said internal portion of said chain are in surface engagement with a major portion of the circumferences of said pipe, and

(d) means to drive said chain to thereby spin said pipe,

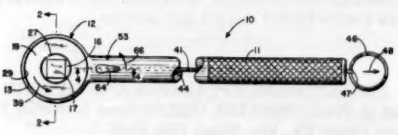
said drive means comprising a drive sprocket wheel meshed with said chain, and means to lock the axis of said drive sprocket wheel in a fixed position when a pipe of predetermined diameter is being spun by said apparatus.

4,099,430

REWIND RATCHET WRENCH

Roger D. Stodola, Rte. 1, Becker, Minn. 55308

Filed Dec. 23, 1976, Ser. No. 754,077
Int. Cl.[2] B25B *13/00*
U.S. Cl. 81—58.1 4 Claims



1. In a wrench for rotating a socket or the like having an elongated handle with an annular head at one end and a longitudinal passage through the handle, said head having a cavity receiving a rotatable drive member having a drive projection, a sleeve in said cavity surrounding said rotatable member, one-way clutch means operable between said member and sleeve, a cable wound around the sleeve and extending outwardly through said handle passage for turning the sleeve and clutched drive member in one direction when pulled outwardly through said passage, and spring means coupled between said head and said sleeve biasing the sleeve to turn declutched in the other direction to rewind the cable around the sleeve,

the improvement therein comprising:

said drive member having axially spaced radially outwardly extending annular flanges defining therebetween a circumferential groove,

said one-way clutch means including an annular series of inclined ramps on said drive member between said flanges, a plurality of inclined ramps on said sleeve in concentric relation to said drive member, and a plurality of rollers disposed between said ramps and lying within and retained by said drive member groove,

said head includes an annular inwardly extending flange at one end of said cavity,

said sleeve includes an inwardly extending annular flange at one axial end thereof substantially engaging said head flange so as to restrict axial movement of said sleeve theretoward,

one of said drive member flanges includes a portion thereof substantially engaging said sleeve flange so as to restrict axial movement of said drive member theretoward, and,

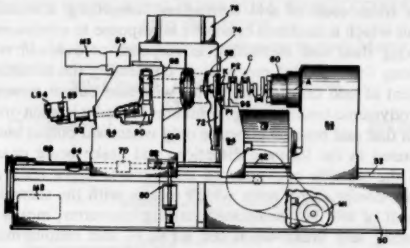
means at the other end of said cavity and said sleeve to preclude axial movement of said sleeve and said drive member, respectively, therepast, thereby to maintain said wrench in assembled relation.

4,099,431

INTERNAL MILLING MACHINE FOR MILLING CRANK PINS

David L. Kreucher, Frankenmuth, Mich., assignor to The Wickes Corporation, Saginaw, Mich.

Filed Jan. 31, 1977, Ser. No. 764,067
Int. Cl.[2] B23B *5/18;* B23C *3/06*
U.S. Cl. 82—9 23 Claims



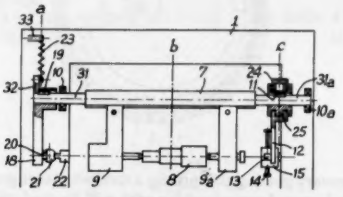
20. The method of milling crank pins on a crankshaft comprising the steps of axially and rotatively indexing the crankshaft to successively locate each of the crank pins at a single fixed milling position, and passing an internal milling cutter in orbital movement about each crank pin in milling contact with the crank pin while the crank pin is located at said milling position.

4,099,432

APPARATUS FOR CONTROLLING THE POSITION OF A TEMPLATE FOR A COPYING MACHINE

Marcel Champeau, and Andre Pelletier, both of Niort, France, assignors to Societa RAMO S.A., Niort, France

Filed Apr. 13, 1977, Ser. No. 787,159
Claims priority, application France, May 6, 1976, 76 13631
Int. Cl.[2] B23B *3/28*
U.S. Cl. 82—14 A 4 Claims



1. In apparatus for controlling the position of a template for a copying machine, permitting the effecting of at least one roughing pass on an adjustable stop and a finishing pass, using a template co-operating with a feeler of a copying apparatus for the control of the tool holder carriage, the template being rockingly mounted on the ends of arms fixed at their other ends to a rod rockably mounted on the frame of the machine, the improvement comprising the rod in rotation said drive means including a drive member capable of selectively bringing in contact a first lever, means for temporarily fixing said first lever to the rod, a series of roughing stops mounted on a hub for defining the roughing passes, a second lever fixed to the rod, a micrometric precision stop for the finishing pass, and drive means effective to bring selectively said first lever into

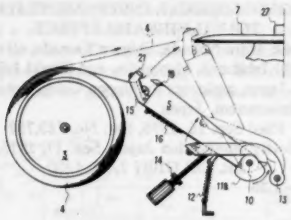
contact with one of said roughing stops or the second lever into contact with said micrometric precision stop.

4,099,433

APPARATUS FOR PROVIDING ADHESIVE STRIPS OF PREDETERMINED LENGTH

Teruhide Muto, Tokyo, Japan, assignor to Shinko Industries Co., Ltd., Tokyo and Toyonaka Kosakusho Co., Ltd., both of, Japan

Filed Jul. 13, 1977, Ser. No. 815,275
Claims priority, application Japan, Jul. 14, 1976, 51-83801
Int. Cl.[2] B65H *45/14*
U.S. Cl. 83—155 10 Claims



1. Apparatus for providing adhesive strips of predetermined length comprising in combination:

a rotatably mounted support member for a roll of adhesive tape;

means for supporting a plurality of adhesive strips which have been cut to a predetermined length;

a feed member pivotably supported for pivotal movement between a first position adjacent said adhesive tape support member and a second position adjacent said adhesive strip support means, said feed member being provided with a cutter plate and a cutter bar movable longitudinally thereof and cooperable with said cutter plate to cut the adhesive tape into strips of predetermined length;

means carried by said feed member for retaining the free end of the adhesive tape of said roll;

a lever rod carried by said feed member movable longitudinally thereof and operably connected to said tape retaining means;

and a plurality of cam means drivable to sequentially move said feed member, tape retaining means, cutter bar and adhesive strip support means; whereby predetermined lengths of adhesive tape are serially withdrawn from said tape support member by pivotal movement of said feed member from said first position to said second position and positioned on said adhesive strip support means, and cut into strips of predetermined length of said cutter bar in cooperation with said cutter plate upon return of said feed member to said first position.

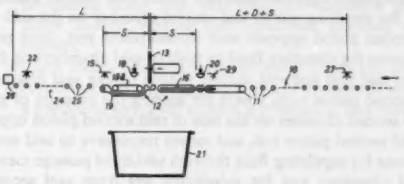
4,099,434

SAWING APPARATUS

Jean Pierre Hardouin, Luisant, France, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Feb. 15, 1977, Ser. No. 768,832
Claims priority, application United Kingdom, Feb. 26, 1976, 7729/76
Int. Cl.[2] B23Q *3/06*
U.S. Cl. 83—157 5 Claims

1. Sawing apparatus comprising a saw, a saw table across which the saw can be traversed, and which includes first and second parts extending respectively on opposite sides of the line of movement of the saw, means for inclining each of said two parts independently of the other to tip material off that part, and a releasable clamp at the same side of said line of movement of the saw as said first saw table part for clamping the lengths of material against movement lengthwise of themselves, the said second saw table part having a nose portion



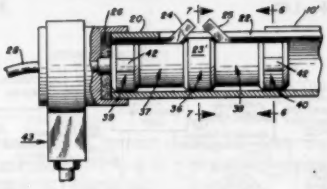
which projects a short distance on said same side of the line of movement of the saw at the general level of the table.

4,099,435

CUTTING KNIFE FOR WINDING MACHINES

Roger W. Young, Upper Montclair, N.J., assignor to John Dusenbery Company, Inc., Clifton, N.J.

Filed Feb. 28, 1977, Ser. No. 773,080
Int. Cl.[2] B26D *5/12*
U.S. Cl. 83—614 9 Claims



1. A cutting knife arrangement for use in severing relatively thin webs of material, said arrangement comprising:

a. a supporting tube having a longitudinally extending slot formed in the wall thereof,

b. a shuttle slidably positioned within the tube and normally disposed at one end thereof,

c. cutter means carried by the shuttle and extending through the said slot, said

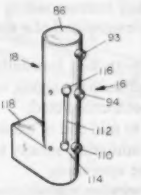
d. means for reducing the air pressure within the tube between the shuttle and the other end of the tube, thereby to move the shuttle to the other end of the tube.

4,099,436

APPARATUS FOR PIERCING SHEET MATERIAL

Donald Joseph Beneteau, 1333 Front Rd. South, Amherstburg, Ontario, Canada

Filed Apr. 11, 1977, Ser. No. 786,299
Int. Cl.[2] B26D *5/12*
U.S. Cl. 83—617 11 Claims



1. Apparatus for piercing sheet material comprising means forming a first chamber, a first piston in said first chamber, a first piston rod connected to said first piston and extending out of said chamber, a punch affixed to an end of said piston rod, means forming a second chamber, a second piston in said

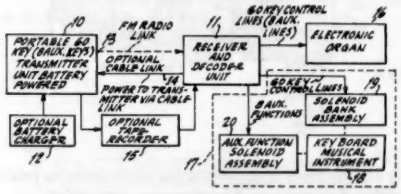
second chamber, a second piston rod connected to said second piston and extendable into said first chamber, first passage means for directing liquid to said first chamber on the side of said first piston opposite said first piston rod, second passage means for directing gas to said second chamber on the side of said second piston opposite said second piston rod, third passage means for directing fluid to both of said chambers on the sides of said first and said second pistons having said first and said second piston rods, means for sensing the pressure of gas in said second chamber on the side of said second piston opposite said second piston rod, and means responsive to said sensing means for supplying fluid through said third passage means to said chambers and for exhausting gas from said second chamber on the side of said second piston opposite said second piston rod upon a sudden drop in the pressure of the gas sensed by said pressure-sensing means.

4,099,437

REMOTE CONTROL WIRELESS KEYBOARD MUSICAL INSTRUMENT

Paul Constantine Stavrou, Allentown, Pa., and William Frederick Slack, Byram Township, Sussex County, N.J., assignors to Jerry L. Noury, Jr., New York, N.Y.

Filed Dec. 17, 1976, Ser. No. 751,595
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **31 Claims**


PORTABLE 60 KEY (BAUX. KEYS) TRANSMITTER UNIT BATTERY POWERED
FM RADIO LINK
OPTIONAL CABLE LINK
POWER TO TRANSMITTER VIA CABLE LINK
OPTIONAL BATTERY CHARGER
OPTIONAL TAPE RECORDER
RECEIVER AND DECODER UNIT
60 KEY CONTROL LINES (BAUX. LINES)
ELECTRONIC ORGAN
60 KEY CONTROL LINES
AUX. FUNCTIONS
SOLENOID BANK ASSEMBLY
AUX. FUNCTION SOLENOID ASSEMBLY
KEY BOARD MUSICAL INSTRUMENT

1. A remote control wireless keyboard musical instrument, comprising:

a musical device having a plurality of musical sound actuating elements, each element when actuated generating a corresponding musical sound;

a portable transmitter having a plurality of keys, each key corresponding to said actuating elements having an electrical switch coupled thereto and actuatable thereby;

electronic switching means for scanning said switches at a first relatively high rate of speed to ascertain which of said switches are actuated;

scan inhibiting means for temporarily interrupting the operation of said scanning means when an actuated switch is detected by said scanning means;

transmitting means coupled to said electronic switching means and responsive to said scan inhibiting means for causing the wireless transmission of a serial digital code identifying the key corresponding to said actuated switch, said code being transmitted at a second relatively low rate of speed;

means associated with said transmitting means for generating an end of transmission signal when the transmission of said code has been completed;

means responsive to said end of transmission signal for resetting said scan inhibiting means to enable said scanning means to resume operation;

a receiver for the wireless signals generated by said transmitter, said receiver reconstructing the serial code transmitted by said transmitter;

decoding means associated with said receiver for providing a plurality of separate output signals corresponding to respective ones of said portable transmitter keys and musical device sound actuating elements;

said receiver including impulse noise resistant error detecting means for providing an error signal indicative of the presence of an error in said reconstructed code;

signal gating means coupled to said decoding means and responsive to said error signal for inhibiting the generation of any of said output signals by said decoding means in response to a reconstructed code having an error therein; and

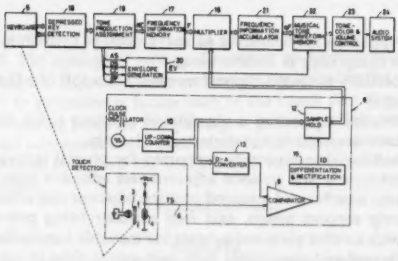
means for coupling each output signal of said decoding means to a corresponding actuating element of said musical device, so that actuation of a given key of said portable transmitter results in actuation of the corresponding element of said musical device.

4,099,438

ELECTRONIC MUSICAL INSTRUMENT HAVING A TOUCH VIBRATO EFFECT

Teruo Hiyoshi; Akira Nakada; Shigeru Yamada, all of Hamamatsu; Kiyoshi Ichikawa, Hamakita, and Sigeki Isii, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 16, 1976, Ser. No. 723,757
Claims priority, application Japan, Sep. 17, 1975, 50-113036
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.25 **6 Claims**



1. A system for producing touch vibrato in a digital electronic musical instrument of the type having a tone generator for generating a tone having a frequency proportional to a digital frequency number F, and note selection means for providing a selected frequency number F to said time generator, said instrument having a touch responsive member and means for producing an analog touch signal having a value proportional to displacement of that member, said system comprising:

signal providing means for providing a reference periodic signal having excursions greater than the maximum range of said touch signal,

comparison means for comparing the value of the analog touch signal to the value of said reference periodic signal, and for providing a digital output each time said touch signal crosses said periodic signal, said digital output having a digital value corresponding to the value of said periodic signal at the point of crossing, and

modulating means for modulating the frequency number F provided by said note selection means by the value of said digital output.

4,099,439

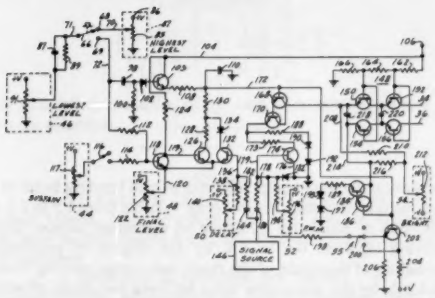
ELECTRONIC MUSICAL INSTRUMENT WITH DYNAMICALLY RESPONSIVE KEYBOARD

David A. Luce, Clarence Center, N.Y., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Continuation-in-part of Ser. No. 479,485, Jun. 14, 1974. This application Jun. 19, 1975, Ser. No. 588,508
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.26 **18 Claims**

1. An electronic musical instrument having a keyboard with

a plurality of keys, said instrument producing musical sounds at pitches corresponding to said keys, and including a weight mounted in each of said keys, sensing means for sensing the momentum with which each of said keys is operated, envelope producing means responsive to said sensing means for producing an envelope signal in response to the momentum with which one of said keys is operated and in response to the time interval since previous operation of said key, said key having a pivotally mounted operating lever and contact means operated by said lever as said key is operated, said contact means being adapted to open a normally closed circuit and subsequently to close a normally open circuit, said contact means comprising a spring having one end connected to a fixed location and the other end connected to said lever, a first conductor normally in contact with said spring for completing said normally closed circuit, and a second conductor spaced from said spring for completing said normally open circuit, a capacitor connected with said spring, means connecting said first conductor to a source of potential for normally charging said capacitor to said



potential, a resistor connected in parallel with said capacitor for discharging said capacitor beginning with the opening of said normally closed circuit, a second capacitor connected with said second conductor for sensing the voltage level of said capacitor on the closing of said normally open circuit, means including said normally open circuit for charging said second capacitor for a short time interval to a level determined in part by the voltage level of said first capacitor at the time said normally open circuit is closed, and in part by the difference in potential between the voltage across said second capacitor at the time of closing of said normally open circuit and a source of supply potential, means for discharging said second capacitor at a controlled rate less than the rate at which said second capacitor is charged when said normally open circuit is closed, whereby said second capacitor is charged to successively higher levels in response to successive operations of said key, signal generating means for producing an AC signal at a frequency corresponding to the operated key, and means for discharging said second capacitor at a rate proportional to said frequency.

4,099,440

PLECTRUM PIANO ACTION

Ellis Barron, 7228 Eads Ave., La Jolla, Calif. 92037

Filed Dec. 6, 1976, Ser. No. 747,798
Int. Cl.² G10C *1/06*
U.S. Cl. 84—258 **2 Claims**

1. In a musical instrument of the harpsichord or plectrum piano type, a plucking means for each string thereof consisting of a key-lever and a plectrum, wherein the improvement comprises:

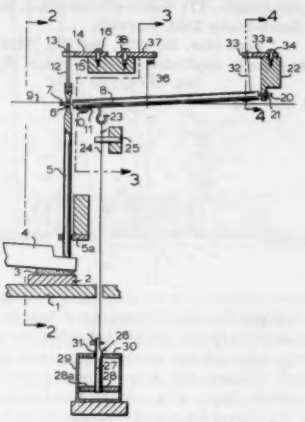
(a) a cylinder means, hollow, closed at one end, and fixed in the instrument,

(b) a piston means having a vent hole and being coaxially slideable within said cylinder means, the combination causing the piston to present a velocity dependent resistance force to motion thereof,

(c) a rotatable pick-rod carrying the plectrum and having a depending crank arm, said pick-rod supported so as to allow limited vertical and horizontal pivoting motion thereof,

(d) jack means connecting the pick-rod to the key-lever,

(e) means connecting the piston to said crank arm such that a portion of key-lever motion is coupled to said piston, the



resistance force thereof tending to draw the pick-rod toward the string and to rotate the plectrum into said string,

(f) a first spring means engaging the pick-rod and opposing said piston resistance force so as to cause the plectrum to avoid the string upon release of the key-lever; and

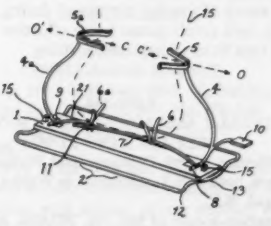
(g) a second spring means fixed to said pick-rod and opposing rotation thereof for the purpose of controlling plectrum angle.

4,099,441

HOLDER FOR GUITARS AND THE LIKE

James M. Landon, 13847 Chandler Blvd., Van Nuys, Calif. 91401

Filed Jun. 28, 1976, Ser. No. 700,345
Int. Cl.² G10D *3/00*
U.S. Cl. 84—327 **1 Claim**



1. In a weighted and rockable stand for holding guitars and similar musical instruments, an arrangement for retaining a musical instrument comprising in combination:

a. two spring loaded, individually pivoted clamping arms, each of said arms having instrument retainer means at its free end for holding said musical instrument in an upright position and, each one of said arms having an inward extension from its respective pivot, one extension bening

slidably coupled to the other by a guide means, each of said extensions also having instrument retaining means;

b. a foot pedal affixed to one of the clamping arms;

c. spring biased hinges serving as pivots for said arms and their extensions;

whereby pressure on said pedal opens both arms simultaneously and release of pressure produces simultaneous closure.

4,099,442

CORRECTIVE DEVICE FOR CLARINETS

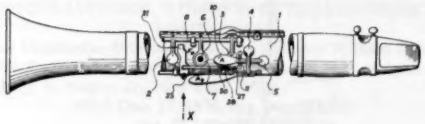
Clive Lyof Amadio, 171 Soldiers Point Road, Salamander Bay, New South Wales 2301, Australia

Filed Mar. 24, 1977, Ser. No. 780,605

Claims priority, application Australia, Mar. 29, 1976, 5406/76

Int. Cl.[2] G10D *7/06*

U.S. Cl. 84—382 **5 Claims**



1. A clarinet having a barrel, an A-key having a convex surface, an F-sharp key and an A-flat key on said barrel, said keys being adjacent one another, and a post projecting from said barrel adjacent said A-key whereby said post limits the extent that the finger of a clarinetist can move axially of the clarinet barrel over the convex surface of the A-key in a direction away from the F sharp key.

4,099,443

TUNING FORK IMPROVEMENT

Jeffrey L. Yates, 3304 Owl Dr., Rolling Meadows, Ill. 60008

Filed Mar. 10, 1977, Ser. No. 776,136

Int. Cl.[2] G10G *7/02*

U.S. Cl. 84—457 **7 Claims**

1. A tuning fork having a pair of tines, a body portion interconnecting the tines and a stem depending from the body portion including

means defining a notch in the free end of the stem for riding on the string of a string instrument during a string tuning process, said notch means being effective to restrain the tuning fork from sliding off the string.

4,099,444

RADIALLY ASSEMBLED FRICTION-GRIP SELF-LOCKING RINGS

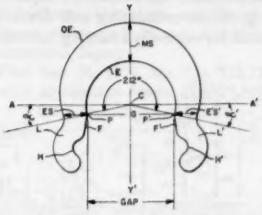
Melvin Millheiser, North Bellmore, and Wallace H. Berliner, Floral Park, both of N.Y., assignors to Waldes Kohinoor, Inc., Long Island, N.Y.

Continuation-in-part of Ser. No. 702,074, Jul. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 577,985, May 16, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,946

Int. Cl.[2] F16B *21/00*

U.S. Cl. 85—8.8 **4 Claims**

1. A retaining ring adapted for either radial or axial assembly on a cylindrical groveless carrier member and which upon assembly possesses the capability of securing itself solely by the friction grip which its inner edge exerts on the surface of said carrier member, said ring comprising an open-ended ring body of spring material having the form of a curved tapered bending beam whose inner edge extends along the arc of a circle of diameter less by a predetermined small amount than that of the cylindrical carrier-member surface and whose outer edge is eccentric to said inner edge in direction such that the ring-body section heights decrease progressively from its middle section having maximum section height to its end sections having minimum section height, said end sections being at points of the ring inner-edge which are disposed symmetrically to the sides of the vertical center line of the ring body and are spaced from one another thereby to define a gap having width less than that of the diameter of said cylindrical surface by a predetermined small amount, said tapered ring body being characterized by the ratio of the inside diameter of the bending beam to the seating diameter of the ring being less than 1; by



the ratio of the inner-edge diameter of said bending beam to its said maximum section height being variable from 1.5 to 2.5; by the ratio of ring-body minimum to maximum section height varying between 0.6 to 0.8; by the degree of permissible spreading of the circle of the ring's inner-edge varying from 6 to 8.5%; by the gap angles lying between two lines, of which the first thereof is a line thru the center of the ring inside diameter perpendicular to a line bisecting the ring gap and the second thereof being a line from the same center extending to end-most real points on the ring inside diameter, varying from 9° to 16°; and means extending from the ring-body ends having gradually decreasing widths and defining a passageway leading to the gap and thence to the ring-body opening, the width of said gap being no less than 96% of the inside ring diameter, wherein 0.96 is the cosine of 16°.

4,099,445

PRESSURE DIFFERENTIAL PISTON-COMBUSTION CHAMBER SYSTEM

Dietrich Singelmann, Ottobrunn; Heinrich Strobl, Munich, and German Munding, Bad Friedrichshall, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Sep. 22, 1969, Ser. No. 862,637

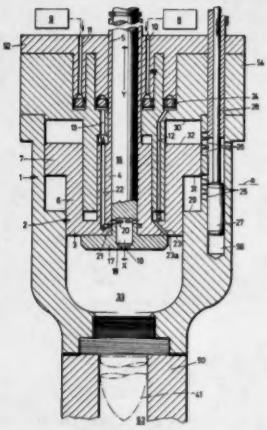
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1968, 1728077

Int. Cl.[2] F41F *1/04*

U.S. Cl. 89—7 **10 Claims**

7. A driving force generating system for propelling a device such as a projectile particularly in a fire arm, comprising wall means defining a combustion chamber, a piston movable in said combustion chamber, propellant component passage means defined in said wall means for delivering propellant components into said combustion chamber, valve means associated with said passage means permitting flow of said propellant components through said passage means into said combustion chamber, said propellant components being reactable in said combustion chamber to move said piston in a working stroke, and additional force means acting on said piston at the beginning of its movement in its working stroke to aid in such movement, said additional force means comprising an annular spring

surrounding said piston, said piston having an annular portion projecting outwardly from the sides thereof and engageable



with said spring at the end of the path of movement thereof in a return direction.

4,099,446

PANTOGRAPH COPYING ATTACHMENT

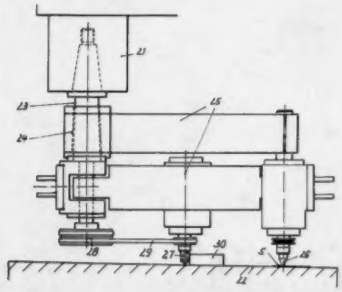
Herbert Hürlin, Pforzheim-Eutingen, Fed. Rep. of Germany, assignor to Karl Hurlin & Co., Pforzheim-Eutingen, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,807

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2556965

Int. Cl.² B23C *1/16, 7/00*

U.S. Cl. 90—13.1 **5 Claims**



1. A pantograph copying attachment for a machine tool having a rotary spindle adapted for receiving and driving a tool about an axis which attachment comprises

a main shaft having connecting means adapted to be connected to said spindle for rotation therewith,

a bearing rotatably carried by said main shaft,

a pantograph mounted on said bearing for an angular movement relative to said shaft about the axis thereof said pantograph including means to carry tool means at a distance from said axis,

a tracer carried by said pantograph at a distance from said axis, and

an angled tool drive mechanism connected to said main shaft and said tool means whereby said tool means is driven from said spindle through said drive means during said angular movement of said pantograph about said axis.

4,099,447

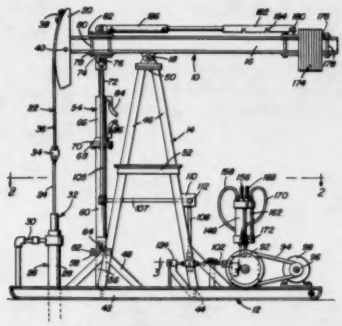
HYDRAULICALLY OPERATED OIL WELL PUMP JACK

Ethridge F. Ogles, Ada, Okla., assignor to Ada Pumps, Inc., Ada, Okla.

Filed Sep. 20, 1976, Ser. No. 724,529

Int. Cl.² F01L *15/00*

U.S. Cl. 91—218 **12 Claims**



1. In combination, a pump jack for well pumps comprising a support, a beam mounted on said support for pivotal movement about a generally horizontal transverse axis, a horsehead at one end of said beam for connection with a polish rod of a well pump, a hydraulic fluid pressure operated piston and cylinder assembly connected to said beam for powering the beam about its pivot axis, a counterbalance weight on said beam on the opposite side of the transverse axis from the horsehead, said piston and cylinder assembly being powered from a hydraulic pump having a separate conduit connected to each end of the cylinder, a reversing valve communicating the pump with the conduits, and means interconnecting the reversing valve and the beam for controlling the position of the reversing valve in response to extension and retraction of the piston and cylinder assembly, said means controlling the reversing valve including a mechanical linkage, said linkage including adjustment means enabling variation in the stroke of the piston and cylinder assembly, each of said conduits including means cushioning high pressure hydraulic fluid moving from the reversing valve to the piston and cylinder assembly for cushioning movement of said beam, each of said cushioning means including a cylinder communicated at one end with said conduit, a piston movable in said cylinder in peripherally sealed relation thereto whereby said piston will move longitudinally in the cylinder in response to pressure changes in the conduits for cushioning movement of the hydraulic fluid in the conduits.

4,099,448

OSCILLATING ENGINE

Gerald H. Young, 2082 Gulfshore Blvd. N., Naples, Fla. 33940

Filed Jan. 19, 1976, Ser. No. 650,068

Int. Cl.² F02B *53/00, 55/00*

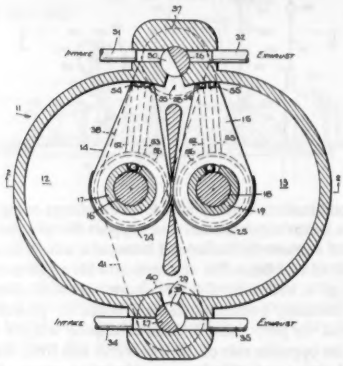
U.S. Cl. 91—339 **10 Claims**

1. A fluid device of the type that includes a housing having a pair of adjacent arcuate chambers extending in substantially opposite directions with respect to one another, each of said pair of chambers having an exhaust opening; a vaned rotor mounted for oscillation within each of said chambers; means for synchronizing the rotors to oscillate in opposite angular directions with respect to one another; means for controlling the flow of a fluid into and out of each of said chambers in timed relation with the oscillation of said rotors, said flow controlling means including a rotary valve member having an exhaust passage therethrough and being disposed adjacent said exhaust opening and means operated in timed relation with the oscillation of said rotors for rotating said valve member from

one position where said valve member closes said exhaust opening to another position where said valve exhaust passage partially overlies said exhaust opening, wherein the improvement comprises:

said exhaust opening for each of said chambers being located adjacent to one extreme position of oscillation of the respective rotor for exhausting fluid from the chamber on one side of the rotor and an intake opening for each of said chambers being located adjacent to said exhaust opening;

said means for controlling the flow of fluid into and out of said chambers comprising a rotary valve member having an intake passage therethrough and being disposed adjacent said intake opening and means operated in timed relation with the oscillation of said rotors for rotating said



valve member from a position where said valve member closes said intake opening to another position where said valve intake passage partially overlies said intake opening, said rotary valve member disposed adjacent said exhaust opening being the same as the rotary valve member disposed adjacent said intake opening; and

a first one of said rotary valve members being located adjacent to the extreme clockwise position of one of said pair of vaned rotors for controlling the flow of fluid into and out of the chamber of said one rotor and

a second one of said rotary valve members being located adjacent to the extreme counterclockwise position of the other said pair of vaned rotors for controlling the flow of fluid into and out of the chamber of said other rotor.

4,099,449

ELECTROMAGNETIC BUCKET POSITIONER FOR LOADER VEHICLES

Koji Orimoto; Masataka Uno, both of Komatsu; Yoshio Oomachi, Hiratsuka, and Yoshitaka Nishimura, Hirakata, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 2, 1976, Ser. No. 746,812
Claims priority, application Japan, Dec. 4, 1975, 50/162156
Int. Cl.[2] F15B *13/16, 11/16, 13/06*
U.S. Cl. 91—358 A **5 Claims**

1. An electromagnetic bucket positioner for loader vehicles including lift cylinders for the bucket and bucket cylinders for tilting the bucket, comprising

a control lever adapted to move fore and aft as well as from side to side,

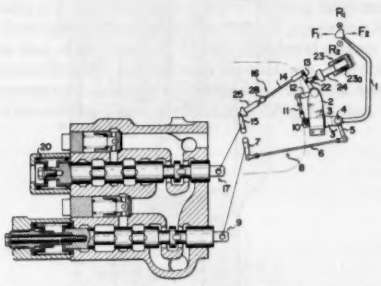
first linkage means connected to said control lever and adapted to be moved in response to the fore and aft movment of said control lever,

first valve means connected to said first linkage means for actuating the lift cylinders for the bucket,

second linkage means connected to said control lever and adapted to be moved in response to the side-to-side movment of said control lever,

second valve means connected to said second linkage means for actuating the bucket cylinders,

electromagnet means disposed adjacent to said second linkage means in such a manner that said second linkage means is not held under restraint by the action of said electromagnet means during normal tilting back operation



of said control lever and is held under restraint only when said control lever occupies a rack-back position,

loose spring means disposed in said second linkage means for loosely connecting said second linkage means with said second valve means, and

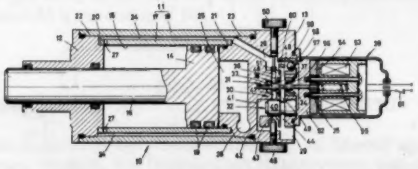
switching means provided on one of said bucket cylinders for interrupting electric current flow through said electromagnet in response to a predetermined movement of a piston rod of one of said bucket cylinders.

4,099,450

FEED MECHANISM

Yoji Mase, Toyokawa, Japan, assignor to Kondo Manufacturing Co., Ltd., Japan

Filed Mar. 11, 1976, Ser. No. 666,089
Claims priority, application Japan, Jun. 27, 1975, 50/80402
Int. Cl.[2] F15B *13/043*
U.S. Cl. 91—403 **17 Claims**



1. A feed mechanism for advancing a load partially at a full rate, then at a reduced rate, and then retracting the load at full rate, said mechanism comprising:

(a) a fluid-pressure actuator having a cylinder carrying a piston from which a rod projects at one end, said cylinder and rod being adapted to act between a reference and the load, said cylinder having a first port at the other end and a second port communicating with said one end;

(b) a 4-way valve for selecting direction of movement and having a first actuator outlet connected to said first port, a second actuator outlet, and other ports for receiving pressurized fluid and for returning fluid, said 4-way valve being disposed remotely from said cylinder;

(c) flow-path control-valve means interconnecting said second port and said second actuator outlet, and having at least three selectable modes of operation respectively providing a first unrestricted flow path therethrough, a second restricted flow path therethrough, and simultaneous blockage of both said flow paths, and said control

valve means including a selector valve having an inlet communicating with said second port and an outlet leading to said second restricted flow path;

(d) electrical means responsive to a predetermined advance of the load for actuating said control-valve means from said first flow path mode to said second flow path mode; and

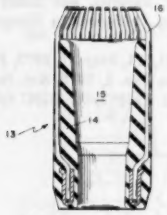
(e) said control-valve means being resettable in response to a reversal of flow by said 4-way valve to reinstate said first flow path mode.

4,099,451

OILWELL SWAB CUP

Henry Wayne Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 27, 1976, Ser. No. 756,304
Int. Cl.² F16J *1/04, 15/32*
U.S. Cl. 92—241 **1 Claim**



1. An improved swab cup assembly comprising:

a unitary base member of U-shaped cross section press formed from a single annular, malleable plate to include an annular bottom portion having inner and outer peripheral edges and first and second wall portions, said first wall portion extending from the inner peripheral edge of said bottom portion and said second wall portion extending from the outer peripheral edge of said bottom portion, said wall portions extending in spaced, generally concentric parallel relationship forming an annular slot therebetween;

a plurality of elongated wire members having straight lower end portions, S-shaped intermediate portions, and inwardly bent upper portions, said lower portions being disposed in said slot in circumferentially spaced relationship and in tight, frictional engagement with said wall portions whereby the lower end portions of said wire members are retained immobile with respect said base member and each other; and,

elastomeric means encapsulating said base member and lower and intermediate portions of each of said wire members for forming said base member and wire members into an annular swab cup assembly.

4,099,452

SMOKESTACK-MOUNTED AIRFOIL

Robert C. Costen, 211 Greenwell Dr., Hampton, Va. 23666

Filed Nov. 10, 1975, Ser. No. 630,582
Int. Cl.² E04F *17/02;* F23L *17/02*
U.S. Cl. 98—58 **21 Claims**

1. A smokestack effluent dispersal system comprising;

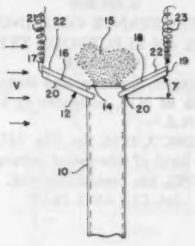
a smokestack;

means located adjacent to the stack gas exit of said smokestack for producing lift component in a downwardly direction and converting the kinetic energy of relative smokestack wind into a plurality of well defined, counter-rotating vortical flows of air and entraining smokestack effluents therein for the duration of said well defined vortical flows.

19. A method of improving the effluent dispersal of a smokestack subject to relative winds comprising the steps of:

providing a smokestack,

providing a vortex generating device for producing lift component in a downwardly direction for converting the kinetic energy of said relative winds into a plurality of well-defined vortical flows of air,



placing said vortex generating device in the flow path of said relative winds and adjacent to the stack gas exit of said smokestack;

entraining said stack effluents in said well-defined vortical flows of air, and

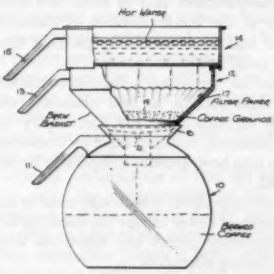
varying the orientation of said vortex generating device to said relative winds in order to vary the flow direction of said well-defined vortical flows of air.

4,099,453

COFFEE-MAKER ASSEMBLY

Steven Kaplan, 71 Driftwood Dr., Port Washington, N.Y. 11050

Filed Apr. 20, 1977, Ser. No. 789,103
Int. Cl.² A47J *31/02, 31/10*
U.S. Cl. 99—306 **9 Claims**



1. A coffee maker assembly having a large maximum capacity rating for brewing coffee, the same assembly being effective in brewing coffee in an amount much below the maximum rating, comprising:

A. a decanter for containing the brewed coffee and for maintaining it at a desired temperature;

B. a disposable paper filter having a frusto-conical form and a flat base on which is formed a bed of ground coffee to be sprayed by boiling water to cause infusion resulting in brewed coffee; and

C. a basket seated on the decanter and having a corresponding frusto-conical form to nest said filter, the base of said filter resting on the bottom of said basket, the bottom of said basket having a central opening through which the brewed coffee passing through the base of said filter is discharged into said decanter, said bottom having a central depressed region surrounding said opening to define a well underlying a restricted central region of said base and an inactive annular zone concentric therewith in contact

with a corresponding annular region of said base, whereby said filter is active only in the restricted central region overlying said well and is effective to control the rate of percolation necessary to brew coffee of good quality regardless of the volume of ground coffee forming said bed.

4,099,454

ELECTRICAL RESISTANCE COOKING APPLIANCE FOR USE WITH AN ELECTRODE TYPE COOKING PACKAGE

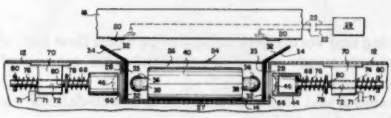
Ernst Theodore Theimer, Rumson, and Robert Stuart Bissett, Tinton Falls, both of N.J., assignors to Lectrofood, Corp., East Brunswick, N.J.

Filed Dec. 3, 1976, Ser. No. 747,309

The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.

Int. Cl.[2] A47J *36/30*

U.S. Cl. 99—358 **3 Claims**



1. An appliance for use in the electrical resistance cooking of an electrically high conducting food substance within an electrode type cooking package which comprises:

(a) A housing defining a packaged food cooking compartment; and

(b) Retractable plunging means including biasing means located inside said housing at opposite ends of said cooking compartment which urge intimate electrical contact between an electrically high conducting food substance held within a subject food package which is set within the food compartment and at least two electrical contacts located at the inside surfaces of diametrically opposite ends of said food containing package thus forming contacted ends; and

(c) Means for imparting a regulated electrical current for finite time periods to said electrical contacts, forcing current through a subject electrically high conducting food substance, cooking same by conversion of electrical energy into heat without undesirable arcing or food burning; and

(d) A protective cover which may exist in an open or closed position; said cover closes the cooking compartment and simultaneously closes the electrical circuit for added safety during operation,

wherein the electrode type cooking package comprises:

(a) An electrically and preferably thermally insulating container which defines a food cavity having a substantially uniform longitudinal area, and an aperture in each of its two most diametrically opposite ends; and

(b) Electrical contacts located at said diametrically opposite ends attached to the inside surface of said container ends, while draping the apertures and extending out of the container by way of flaps to a source of electrical energy; and

(c) A composition in intimate contact with the inner surfaces of said electrical contacts and the subject foodstuff consisting essentially of:

(i) An aqueous gel selected from the group consisting of agar, xanthan, gum, tragacanth, guar gum, gum arabic and algin gum, in water; and

(ii) A substantially ionized species selected from the group consisting of sodium chloride, potassium chloride, ammonium chloride, magnesium chloride, sodium glutamate, potassium glutamate, sodium alginate, potassium alginate, ammonium alginate, magnesium alginate, calcium alginate, sodium bicarbonate, potassium bicarbonate, magnesium bicarbonate, calcium bicarbonate

wherein:

(i) The weight percent of water is initially 86 up to 99.3

(ii) The weight percent of gel is initially 0.5 to 4.0; and

(iii) The weight percent of edible ionized species is initially from 0.2 up to 10.0

whereby continuous intimate contact during the entire cooking process takes place between the metal electrode and the meat in order to prevent burning, said plunging means causing said contacted end to follow the change in shape of the meat during cooking, and said biasing means causing said plunging means to follow said change in shape of said meat during cooking.

4,099,455

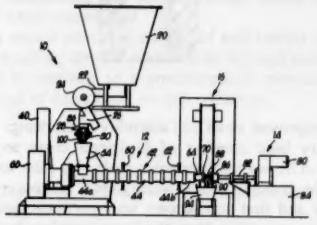
DOUBLE-EXTRUSION APPARATUS FOR PRODUCING DENSE, UNIFORMLY LAYERED VEGETABLE PROTEIN MEAT ANALOGUE

La Von Gene Wenger, Sabetha, and Elmer John Osterhaus, Seneca, both of Kans., assignors to Wenger Manufacturing, Sabetha, Kans.

Division of Ser. No. 581,111, May 27, 1975, Pat. No. 3,970,761. This application Jun. 1, 1976, Ser. No. 691,635

Int. Cl.[2] A23J *3/00*; A23P *1/00*; B29C *9/00*; B29F *3/08*

U.S. Cl. 99—450.1 **6 Claims**



1. Apparatus for producing a dense, layered meat analogue from an admixture including vegetable protein and water, said apparatus comprising:

means for heating and agitating said admixture for rendering the same hot, flowable and substantially unoriented including an elongated, generally tubular first barrel having a receiving end and a delivery end, with an elongated, axially rotatable screw positioned within the first barrel and operable to move said admixture therethrough;

an elongated, generally tubular second barrel having a receiving end and a delivery end,

means adjacent said receiving end of said second barrel for receiving said admixture from the delivery end of said first barrel and delivering the same to the interior of said second barrel,

said receiving and delivery means including structure defining an opening in communication with the interior of said second barrel, said opening-defining structure being in spaced relationship from the delivery end of said first barrel for passage of the admixture through the atmosphere between the first and second barrels for allowing undesirable flavor precursors and the like to leave the admixture;

an elongated, axially rotatable screw situated within said second barrel for moving said admixture through the latter in a direction toward the delivery end thereof while simultaneously subjecting the admixture to displacement forces which are generally transverse of the longitudinal axis of the second barrel;

a hollow, tubular section presenting an elongated processing area mounted on the delivery end of said second barrel in substantial longitudinal alignment therewith and in communication with the interior of the latter;

a die plate positioned over the end of said section remote from said second barrel and being provided with a plurality of circumferentially arranged die openings positioned about the periphery thereof; and

flow directional means positioned within said section for directing the flow of said admixture toward the die openings of said die plate.

4,099,456

TREATMENT OF VEGETABLES

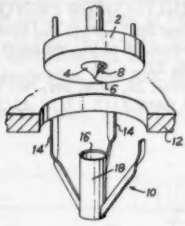
David John Cornish, Dereham, England, assignor to Dreibholz & Floering Limited, Dereham, England

Filed Jul. 19, 1976, Ser. No. 706,200

Claims priority, application United Kingdom, Jul. 23, 1975, 30724/75

Int. Cl.² A23N *15/01*

U.S. Cl. 99—638 6 Claims



1. Apparatus for the treatment of agricultural produce having a central stalk or core bearing leaves, florets or the like, comprising:

a cutting member comprising an annular cutting edge surrounding an opening defined by said annular edge for receiving said central stalk or core;

a divider member having a surface having a projection extending therefrom and rigidly mounted thereon for movement therewith;

means for positioning said divider member so as to confront said opening in said cutting member;

said projection being substantially circular in plan and comprising a central raised point portion extending towards said opening and concave side portions sloping concavely outwardly and rearwardly from said point portion to said surface from which said projection extends;

means for moving said cutting member and divider member relatively towards one another along a path lying parallel to the longitudinal axis of said annular cutting edge of the cutting member, an extension of said axis passing through said raised portion of said divider member, whereby, in use, an item of produce having a cut stalk or core end positioned between said divider member and cutting member with the cut end adjacent said opening of said cutting member is moved relative to said cutting member with said divider member to cause the cutting member to progress through said produce item from the cut end thereof to remove the leaves, florets, or the like, while the raised point and concave sloping side portions of said projection extending from said surface of said divider member divide and deflect the leaves, florets, or the like, at a region opposed to said cut end to cause the deflected leaves, florets, or the like, to lie substantially radially of said axis for cutting by said cutting member.

4,099,457

METHOD FOR DISCHARGING REFUSE

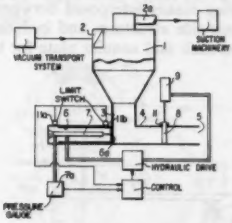
Hans Olof Hyden, Stockholm, Sweden, assignor to AB Centralsug, Solna, Sweden

Continuation-in-part of Ser. No. 573,331, Apr. 30, 1975, abandoned, which is a continuation of Ser. No. 332,099, Feb. 13, 1973, abandoned. This application Nov. 1, 1976, Ser. No. 737,569

Claims priority, application Sweden, Feb. 25, 1972, 2384/72

Int. Cl.² B30B *7/04*

U.S. Cl. 100—42 3 Claims



1. A method of discharging refuse through a discharge pipe being in communication with a hopper having an outlet through which refuse is successively introduced into the discharge pipe from a vacuum transport system, comprising the following steps:

a. advancing a compactor gate into the discharge pipe in a direction perpendicular to the length dimension of the discharge pipe at a location between the hopper outlet and a discharge outlet of the discharge pipe for blocking the internal longitudinal passage thereof to substantially prevent air from being drawn into the vacuum transport system through the discharge outlet and the hopper;

b. subsequent to the completion of step (a) repeatedly reciprocating a compactor pusher in the discharge pipe from a withdrawn limit position in which communication between the hopper outlet and the discharge pipe is open, towards the lowered compactor gate to accumulate and compress successively introduced refuse between the compactor pusher and the compactor gate;

c. during performance of step (b), withdrawing the compactor gate to clear the discharge pipe passage when the refuse compressed between the compactor pusher and the compactor gate has reached a sufficient density to form a substantially vacuum tight plug;

d. during continued performance of step (b) and in timed coordination with the reciprocation of the compactor pusher, clamping a refuse portion firmly against the discharge pipe with an edge of the compactor gate while the reciprocating compactor pusher is being withdrawn into said withdrawn limit position and again withdrawing the compactor gate while the reciprocating compactor pusher is moving from the withdrawn limit position into the discharge pipe to forward the refuse continuously accumulated and compressed in step (b) towards and through the discharge outlet of the discharge pipe.

4,099,458

CONE PRESS

Peter Seifert, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Continuation-in-part of Ser. No. 563,124, Mar. 28, 1975, Pat. No. 3,948,165. This application Apr. 5, 1976, Ser. No. 673,445

Int. Cl.² B30B *9/06, 3/04*

U.S. Cl. 100—116 8 Claims

1. A cone press comprising:

(a) a frame,

(b) a pair of rigid side structures supported on said frame for relative pivotal movement,

(c) a pair of rotor assemblies having their axes arranged at an

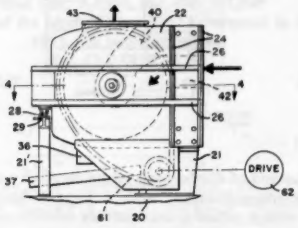
angle to each other and including confronting faces defining a pressing zone,

(d) means mounting each of said rotor assemblies for rotation in a respective said side structure,

(e) each said rotor assembly including a conically shaped screen forming said confronting face thereof and an annular plate forming the axially outer face thereof,

(f) drive means for rotating said rotor assemblies to bring portions of said screens into proximity in a pinch zone while separating other portions of said screens to form a feed receiving zone,

(g) thrust bearing means interposed between said annular plates and said side structures and including an annular thrust pad on each said annular plate for transmitting to



the associated said side structures the thrust generated by said confronting faces in said pressing zone,

(h) hydrostatic bearing means for hydraulically compensating for said thrust between said thrust pads and said side structures to minimize the energy requirements for operation of said press,

(i) said hydrostatic bearing means comprising means defining at least one open pocket in each said side structure, and means for supplying pressurized fluid to each said pocket to form a fluid cushion between said pocket and said annular plate means, and

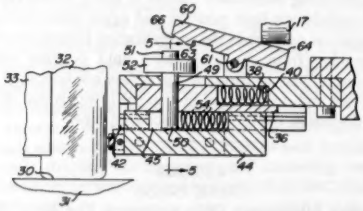
(j) means responsive to the load on said drive means for increasing and decreasing said fluid supply in relation to said drive means load.

4,099,459

INERTIA PRINTING MEMBER

Frederick W. Pfleger, 1152 Barbara Dr., Cherry Hill, N.J. 08034

Filed Nov. 5, 1976, Ser. No. 739,067
Int. Cl.[2] B41F *17/00*
U.S. Cl. 101—35 **8 Claims**



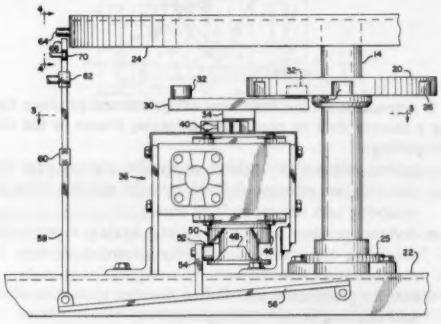
1. A printing mechanism for printing an article at a printing station and comprising a support, a carrier mounted on said support for shifting movement into and out of an extended position toward a printing station, an abutment located for abutting engagement with said carrier to limit its shifting movement to said extended position, primary resilient means urging said carrier toward said extended position, latch means on said support and carrier releasably holding the latter in a retracted position away from the printing station against the force of said primary resilient means, an inertia member carried by said carrier for movement therewith and mounted on said carrier for shifting movement relative thereto toward and away from the printing station, type means on said inertia member for movement therewith into and out of printing engagement with an article at the printing station, secondary resilient means urging said inertia member to a retracted position relative to said carrier away from the printing station, positive retraction means movable relative to said support, connection means between said retraction means and carrier for retracting the latter to its retracted position, and latch release means for disengaging the latch means, whereby disengagement of the latching means releases said carrier for movement to its extended position together with said inertia member which continues inertially relative to said carrier against the force of said second resilient means into type printing engagement with an article and instantaneously retracts by the force of said second resilient means, said support being movable past the printing station, and said retraction means being operative upon support movement beyond the printing station to retract the carrier after printing.

4,099,460

TURRET INDEXING AND REGISTRATION MEANS FOR MULTI-COLOR PRINTER

Henry J. Bubley, Deerfield; Claude H. Oltra, Chicago, and John R. Krutsch, Glenview, all of Ill., assignors to American Screen Printing, Chicago, Ill.

Filed Nov. 29, 1976, Ser. No. 745,530
Int. Cl.[2] B41F *1/12, 15/10, 15/26, 17/38*
U.S. Cl. 101—44 **2 Claims**



1. In a printing assembly having a turntable, a frame, said turntable being supported on a support means, said support means mounted at one end thereof in said frame to provide for rotation of said turntable, a plurality of printing stations spaced about the periphery of said turntable, a corresponding number of printing machines being operatively positioned at each of said spaced printing stations, and a plurality of platens at least equal to the number of printing stations, each platen supported on said turntable, the improvement comprising indexing means and locking means for successively indexing, registering and locking said platens at said stations prior to a printing cycle and having a drive shaft mounted on said turntable frame, said drive shaft rotatable about a central axis thereof, an actuating means disposed about said drive shaft and responsive to the rotation of said drive shaft, a drive arm mounted on said drive shaft for rotation therewith, said drive arm having a first roller means and a second roller means mounted on opposite ends thereof, a drive wheel concentrically mounted about said turntable support means, each of said first and second roller means being operatively engageable with said drive wheel to rotate said turntable in a continuous series of increments, such that in each increment of rotation, said turntable is moved until said actuating means stops rotation of said drive shaft after a

preselected angular distance and said locking means operates in conjunction with said indexing means to register and lock said turntable prior to initiation of said printing cycle to assure that each platen is positively locked into a desired position and is accurately registered at each station during each said printing cycle, said locking means having a locking pin fixedly mounted on the periphery of said turntable at each station, a locking bar, a rod, said rod pivotally mounted at a first end thereof to said frame, an arm, said arm extending from said rod and captivated in a cam, said cam mounted concentrically on said drive shaft for rotation therewith, said rod being connected to said locking bar at a secoond end thereof, said cam rotating to drive said locking bar vertically to engage said locking pin and guide means fixedly positioned at at least one of said stations to direct the vertical movement of said locking bar in the engagement of said locking pin to assure accurate and positive registration of said turntable.

4,099,461

CONTROL DEVICE FOR CONTROLLING THE LEVEL OF A LIQUID IN A CONTAINER

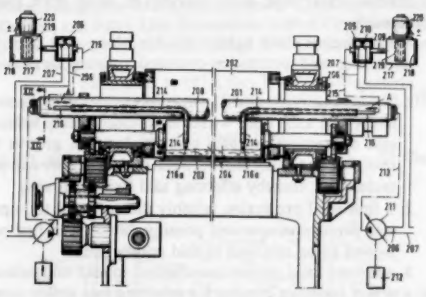
Mathias Mitter, Senne, Fed. Rep. of Germany, assignor to Mitter & Co., Schloss Holte, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 413,992, Nov. 8, 1973, Pat. No. 3,981,619. This application Feb. 2, 1976, Ser. No. 654,172

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1972, 7241055[U]

Int. Cl.[2] B41L *13/00, 13/04*

U.S. Cl. 101—119 **17 Claims**



1. In a screen printing device, a combination comprising an endless printing screen bounding an elongated space adapted to receive a printing medium; means for advancing said printing screen in an endless path with reference to a web onto which said screen is to print; means for admitting flowable printing medium into said space; elongated transmitting means extending into said space through one axial end thereof for transmitting a control medium therethrough said transmitting means having a free end located in said space upwardly adjacent the printing medium therein; means encompassing said transmitting means in at least two spaced regions and mounting said transmitting means for longitudinal movement in a path having a horizontal and a vertical component to steplessly adjust the position of said free end in vertical direction relative to said printing screen so that the position of said free end may be adjusted in accordance with the desired level of printing medium in said space; and control means operatively connected with said admitting means and actuated by the control medium passing through said transmitting means, when the level of printing medium rises to and contacts said free end of said transmitting means, said control means being operative for controlling the operation of said admitting means when actuated by said control medium.

4,099,462

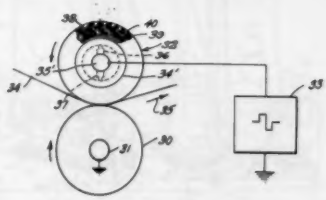
ALTERNATING CURRENT ENERGIZED PRINTING SYSTEM UTILIZING A DIELECTRIC COVERED RESILIENT IMPRESSION ROLLER

Daniel A. Coberley, and Joel F. Hutchison, both of Danville, Ill., assignors to Hurletron Altair, Inc., Danville, Ill.

Continuation of Ser. No. 373,367, Jun. 25, 1973, abandoned, and a continuation-in-part of Ser. No. 188,606, Oct. 12, 1971, abandoned, which is a division of Ser. No. 852,783, Aug. 25, 1969, abandoned. This application Oct. 9, 1974, Ser. No. 513,498

Int. Cl.[2] B41F *9/06;* **G03G** *13/14, 15/14*

U.S. Cl. 101—153 **6 Claims**



1. In a system for assisting the transfer of ink, carried on a metal printing cylinder connected to ground potential, to a web of substantially non-conductive material as the web passes along a web path through a nip between the grounded printing cylinder and the outer perimeter of a resiliently covered metal impression cylinder, including the combination of:

an electrically conductive inner layer of resilient material on said impression cylinder,

means mounting said impression cylinder for rotation on its central axis and insulating said electrically conductive layer of resilient material on said impression cylinder from ground potential,

an outer sleeve of dielectric material of homogeneous continuous annular cross section having a width substantially equal to the width of the outer perimeter of the impression cylinder, and having a resistivity substantially greater than that of said conductive layer, and

means comprising an electric circuit connected with said electrically conductive layer for applying an electric potential between said electrically conductive layer and said grounded printing cylinder,

the entire operative width of the outer perimeter of the impresion cylinder being formed entirely by said dielectric material of said outer sleeve, said dielectric material having a thickness less than $\frac{1}{4}$ of an inch and having a dielectric constant between 20 and 100, and said electric circuit comprising an alternating potential source for applying an alternating current electric potential between said electrically conductive inner layer of resilient material and said grounded printing cylinder to produce an alternating reactive current from said electrically conductive inner layer through said dielectric material of said outer sleeve over the entire operative width of said impression cylinder.

4,099,463

SUPPORT ARRANGEMENT FOR GUIDING SHEETS THROUGH A PRINTING MACHINE

Hans Zimmermann, Coswig; Otfried Rudolph, Dresden; Gunter Peter, Zittau, and Günter Wiesbach, Radebeul, all of German Democratic Rep., assignors to VEB Polygraph Leipzig Kombinat Fuer Polygraphische Maschinen und Ausruestungen, Leipzig, German Democratic Rep.

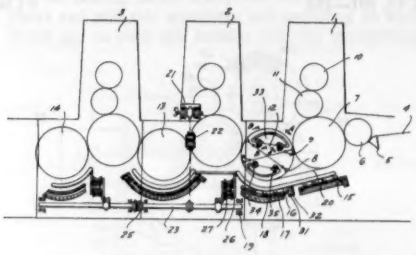
Filed Apr. 13, 1977, Ser. No. 787,236

Int. Cl.[2] B41F *5/02*

U.S. Cl. 101—230 **9 Claims**

1. In a printing machine, a combination comprising a plurality of printing stations for printing images on major surfaces of sheets passing therethrough; means for advancing the sheets in

a predetermined path through and between said printing stations including at least one transfer drum intermediate said printing stations and operative for transferring the respective sheet from one to another of said printing stations, and means for so reversing the respective sheet intermediate two of said printing stations that a respective major surface of the respective sheet having a freshly printed image thereon faces downwardly, including a reversing drum, at least one of said drums including a drum cap located within and extending at both sides short of the periphery of said one drum; and means for



supporting each respective sheet from below during the advancement thereof in at least one portion of said path which is located at and downstream of said reversing means, including a blow casing extending over the entire width of the machine and along said path portion underneath the same and having a plurality of upwardly oriented apertures through which a pressurized gaseous medium issues from the interior of said blow casing toward said path portion at least during the advancement of the respective sheet in the latter, and at least one sheet-guiding bracket arranged intermediate said blow casing and at least a zone of said path portion.

4,099,464

SHAPED EXPLOSIVE CHARGE CASING

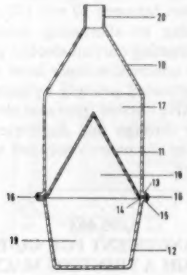
Graham Westwood Cross, Saltcoats, and Thomas James Reid, Ardrossan, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 14, 1977, Ser. No. 759,556

Claims priority, application United Kingdom, Mar. 1, 1976, 8065/76

Int. Cl.² F42B *3/08*

U.S. Cl. 102—24 HC **13 Claims**



1. A casing for a sea-water-destructible shaped explosive charge comprising an explosives container element, a metal cavity liner element, adapted with the explosives container element to define a chamber for a shaped explosive charge, and a stand-off element adapted to define a stand-off volume for the shaped explosive charge, all three elements being bound together by a joint formed at the peripheral margin of each element, which joint comprises material which is destroyed by exposure to sea water whereby, on prolonged exposure of the casing to sea water, said material is destroyed and said elements are separated so as to permit the explosive contents of the shaped explosive to be dispersed in the sea water and rendered harmless.

4,099,465

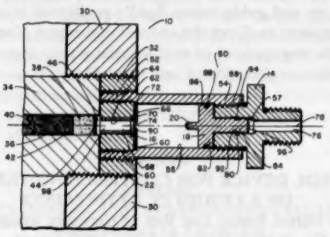
IGNITION DEVICE FOR MISSILE MOTORS

Frederick L. Haake, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1976, Ser. No. 751,638

Int. Cl.² F42C *19/08*

U.S. Cl. 102—204 **5 Claims**



1. A pneumatic igniter firing adapter comprising:

a. a housing containing a percussion-operated priming device;

b. a hollow body having a first end cooperative with said housing such that said housing is connectable to said hollow body, said body having an axial bore therethrough;

c. striker means fluid tightly slidable along said bore for impacting said percussion-operated priming device, including:

1. a midsection suitably dimensioned to fluid-tightly slide along said axial bore within said hollow body wherein said midsection includes a circumferential groove for retaining an O-ring seal between said axial bore and said midsection, thereby effecting said fluid-tight seal;

2. a first axial projection suitably dimensioned to impact said percussion-operated priming device, said first projection being attached to said midsection;

3. a second axial projection attached to said midsection;

d. a striker retaining housing for retaining said striker means in an inoperable position by an O-ring mechanically keyed between said second axial projection of said striker means and said striker retaining housing, said striker retaining means having an axial bore therethrough; and

e. means connected to said hollow body for supplying a fluid to the backside of said striker means, said fluid dislodging said striker means from its inoperative position and forcing said striker means to impact said priming device.

4,099,466

TRAJECTORY ADAPTIVE SAFETY-ARMING DEVICE

Stephen L. Redmond, Ridgecrest; James E. Means, China Lake, and Michael R. Osburn, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1977, Ser. No. 793,998

Int. Cl.² F42C *15/40*

U.S. Cl. 102—215 **10 Claims**

1. A safety-arming device having a variable arming point for use in a maneuvering, explosive missile, comprising:

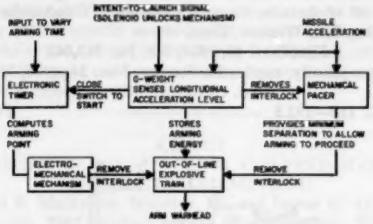
an explosive path having an element which is movable between unarmed and armed positions;

acceleration responsive means operable to detect missile acceleration in the longitudinal direction and in at least

one lateral direction, and operable to generate an output signal in response to said missile acceleration;

integrating means coupled to said acceleration responsive means and operable to compute missile displacement in response to said output signal;

logic means coupled to said integrating means, said logic means being operable to compare said computed missile



displacement with a predetermined minimum missile displacement, and to send an arming signal if said predetermined minimum displacement is exceeded by said computed displacement; and

means responsive to said arming signal for moving said explosive path element from said unarmed position to said armed position.

4,099,467

SEQUENTIAL INITIATION OF EXPLOSIONS

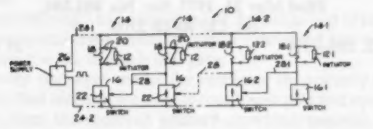
Jeremy Margreave MacKellar, Benoni; Christopher Michael Dryden, and Peter Alan Brazendale, both of Cape Town, all of South Africa, assignors to Plessey S.A. Limited, Cape Town, South Africa

Filed Dec. 8, 1976, Ser. No. 748,438

Claims priority, application South Africa, Dec. 23, 1975, 75/7981

Int. Cl.[2] F42C *15/40*

U.S. Cl. 102—217 **23 Claims**



1. An activating means for sequentially activating a plurality of electrically actuable initiators, including

a series of activating modules arranged in first and second sets,

first connecting means for connecting each of the activating modules to a different one of the initiators,

each activating module having a controllable, electrically operable switch means and disabling means for disabling the switch means of the immediately succeeding activating module, each disabling means being such that it disables the switch means of the succeeding activating module until the initiator associated with its own activating module has been activated,

second connecting means for connecting the disabling means of each activating module to the switch means of the succeeding activating module, and

third connecting means for connecting the activating modules to a power supply means and including separate power supply cables for supplying power independently to either the first or the second set of activating modules thereby to energize either the first or the second set of activating modules.

4,099,468

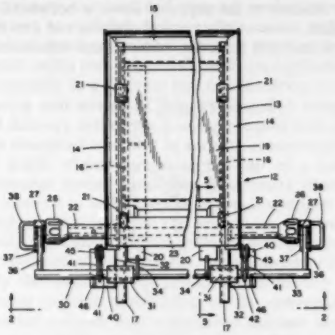
LOCK FOR A HOPPER CAR OUTLET GATE

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Jul. 15, 1976, Ser. No. 705,743

Int. Cl.[2] B61D *7/02*

U.S. Cl. 105—310 **7 Claims**



1. A discharge gate for a hopper having a discharge opening, said gate including a frame attached to said hopper at said opening,

a horizontally movable closure gate slidingly supported on said frame for movement from a closed position beneath said opening to an open position to one side of said opening,

an actuating shaft rotatably mounted on said frame,

actuating means on said gate operated by said actuating shaft for slidingly moving the gate between said positions,

said actuating shaft having at opposite ends thereof operating heads adapted to receive external operating means for rotating said shaft, the improvement comprising;

a lock assembly for locking said sliding gate in a closed position including,

a locking shaft,

means rotatably supporting said locking shaft in laterally spaced relation on said frame,

locking plate means supported on said locking shaft in a locking position engaging and blocking opening movement of said gate, and

means on said locking shaft in the locking position blocking operating means access to said operating head,

said blocking means being movable with said locking shaft and said locking plate means to an unlock position whereupon operating access to said operating head is achieved,

said locking shaft extending substantially parallel and coextensive with said actuating shaft,

said blocking means including arms projecting in U-shaped configuration from said locking shaft and being rotatable with said locking plate means to an unlock position,

said arms including handle means adapted to be grasped by an operator on either side of said gate for moving said locking shaft between lock and open positions,

said handle means being connected to said blocking means and projecting outwardly with respect thereto.

4,099,469

DRAFTING TABLE

Fritz Sahli, Thun, Switzerland, assignor to Albert Fritschi, Berne, Switzerland

Filed Apr. 22, 1977, Ser. No. 790,126

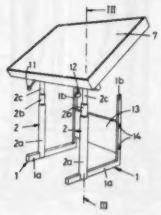
Claims priority, application Switzerland, Apr. 29, 1976, 5419/76

Int. Cl.[2] A47F *5/12*; A47B *27/00*

U.S. Cl. 108—1 **6 Claims**

1. An adjustable drafting table adapted to be stored in a

collapsed, essentially planar configuration, comprising: first and second, generally U-shaped table supports, each support including a generally horizontally disposed base member and a pair of spaced apart, upwardly protruding first and second support posts; transverse means rigidly interconnecting upper ends of the first posts in relative, spaced apart positions; means securing a table plate to the supports for pivotal movement of the plate relative to the supports about a horizontal axis between a first, substantially vertical position and a second position that is inclined from the vertical; and adjustment means



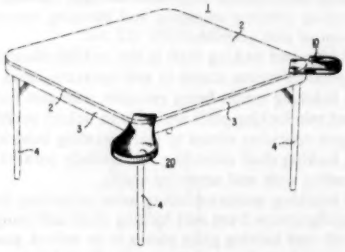
disposed within the first posts, connecting the upper ends of the first posts with corresponding lower ends of the first posts, and permitting relative vertical and relative pivotal movements about vertical axes between the upper ends and the lower ends of the first posts so that the U-shaped supports can be positioned in opposing and spaced apart relation to each other for supporting a portion of the table plate on the second posts while the U-shaped supports can be pivoted to substantially align the second posts with the first posts and the table plate can be pivoted into the vertical position for storage of the drafting table in a space saving configuration.

4,099,470

CARD TABLE ATTACHMENT

Thomas C. Cannon, Jr., 5244 Lake Springs Dr., Dunwoody, Ga. 30338

Filed Sep. 17, 1976, Ser. No. 724,598
Int. Cl.[2] A47B *97/00*
U.S. Cl. 108—26 **14 Claims**



1. An attachment for use with any conventional foldable table which is characterized by a compliant cover mounted on a rigid supporting frame member, said attachment comprising in combination:

a tongue comprising a member not exceeding about 3/32 inch in thickness and having a flexural modulus of at least about 2.5×10^5 pounds per square inch, said member having substantially flat parallel major surfaces,

a tray connected to at least one edge of said tongue,

said tongue being insertable between the compliant cover and the frame of the table thereby deflecting the compliant cover to permit entry of said tongue,

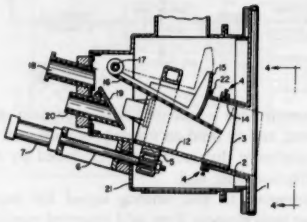
the cover, the frame, and said tongue thereby combining to provide support for said tray in outwardly extended cantilevered fashion in a substantially horizontal plane adjacent an edge of the table, thereby to furnish the sole support for said attachment.

4,099,471

APPARATUS FOR CLEANING THE AIR NOZZLES AND REGULATING AIR FLOW THERETO IN CHEMICAL RECOVERY BOILERS

Georg Sander; Sven Eric Jacobson, and Åke Magnus Ivar Ericson, all of Jarfalla, Sweden, assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 19, 1976, Ser. No. 743,442
Claims priority, application Sweden, Nov. 24, 1975, 7513171
Int. Cl.[2] F23L *5/00*
U.S. Cl. 110—182.5 **2 Claims**



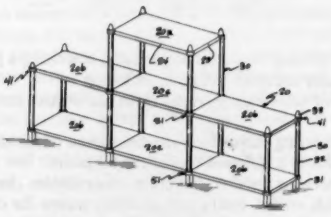
1. In combination, walls forming a furnace, air passage means connected to the furnace through a nozzle, a scraping sleeve mounted within the passage means, said scraping sleeve being slightly smaller in cross section than the nozzle, means for moving the sleeve toward and away from the furnace, said nozzle having a sleeve support extending around the entire inner periphery of the nozzle, so as to have line contact with the scraping sleeve around its entire periphery, and damper means for regulating the air flow to the nozzle.

4,099,472

FREE STANDING SHELVING SYSTEM

Harlan F. Kellogg, 1617 Sprucewood, Rockford, Ill. 61107

Filed May 31, 1977, Ser. No. 801,556
Int. Cl.[2] A47B *3/00*
U.S. Cl. 108—114 **15 Claims**



1. In a free standing shelving system including a plurality of shelves each having upper and lower faces and side and end edges at the sides and ends thereof, and a plurality of spindle assemblies for supporting the shelves, some of the shelves being arranged in endwise adjacent relation whereby the shelving system has some abutting shelf ends and some free shelf ends, the improvement comprising: each shelf having its corner portions removed to provide like corner openings which extend vertically through the shelf at all four corners thereof, which corner openings intersect the adjacent side and end edges of the shelf generally symmetrically of the virtual shelf corner, the abutting shelf ends having their corner openings contiguous and their virtual corners substantially coinci-

dent, one of said spindle assemblies being located at each corner opening at the free shelf ends and one of said spindle assemblies being located at the contiguous corner openings on the abutting shelf ends, each spindle assembly including upper and lower spindle members having end faces at the adjacent ends thereof overlapping portions of the shelf adjacent the respective corner opening, each spindle assembly including an adapter member extending between the adjacent end faces on associated ones of the upper and lower spindle members externally of the shelf, and threaded connector means extending axially of the spindle assembly and in substantial alignment with the virtual corners of the shelves for clamping associated ones of the upper and lower spindle members to the respective adapter member and to the shelf.

4,099,473

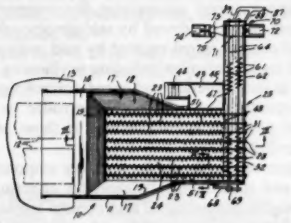
FUEL HANDLING, METERING AND PREPARATION APPARATUS AND METHOD

Harold B. Mackenzie, Wheaton, Ill., and Ingvar G. Anderson, Dunedin, Fla., assignors to New Life Foundation, Wheaton, Ill.

Continuation-in-part of Ser. No. 619,056, Oct. 2, 1975, abandoned. This application Sep. 7, 1976, Ser. No. 721,163

Int. Cl.[2] F23G *5/02*; F23K *3/00*

U.S. Cl. 110—219 **39 Claims**



1. A shredded fuel handling, metering and preparation apparatus, comprising:

a bin for receiving bulk coarse primary shredded fuel material;

means defining a metering gate at a discharge end of said bin;

metering conveyor means for moving shredded fuel material from the bin through said gate;

delivery conveyor means for receiving the primary shredded fuel material metered through said gate and operative to form the received primary shredded material into a stream of substantial width and substantially uniform depth;

a hammer mill reshredder having a plurality of hammers which receive material to be shredded through a horizontally elongated inlet port into which the stream of primary shredded materal is delivered from the conveyor means to the hammers for efficient uniform reshredding into a preferred ultimate fuel particle size;

said delivery conveyor means comprising a transverse delivery conveyor of substantial width subjacent to said gate;

said conveyor acting on said shredded fuel material received on the conveyor to spread the material substantially uniformly across the conveyor and advancing the material along the conveyor toward the reshredder; and

said delivery conveyor having a delivery end of substantially the same width as the length of said inlet port and registering with said inlet port so that the uniformly spread stream of primary shredded material is deposited into the reshredder from said delivery conveyor substantially uniformly throughout substantially the inlet port length and so that all of the hammers of the reshredder receive substantially the same metered quantity of the primary shredded material delivered through said inlet port whereby overloading of any of the hammers is avoided.

14. A method of handling, metering and preparation of shredded fuel, comprising:

receiving bulk coarse primary shredded fuel material in a bin;

moving the primary shredded fuel material from the bin through a metering gate at a discharge end of said bin;

receiving on delivery conveyor means subjacent to said gate the primary shredded fuel material metered through said gate and on said delivery conveyor means spreading the received primary shredded material into a stream of substantial width and substantially uniform depth and moving the material to a delivery end of the conveyor means;

delivering said stream of primary shredded material from said delivery end of the conveyor means into a horizontally elongated inlet port of a length substantially equal to the width of said stream in the top of a hammermill reshredder having a plurality of hammers which receive the material to be reshredded through said inlet port; and

depositing said stream into the reshredder substantially uniformly throughout substantially the inlet port length and thereby to all of the hammers in the reshredder in substantially the same metered quantity and thereby effecting efficient uniform reshredding of the delivered primary shredded material into a preferred ultimate fuel particle size and avoiding overloading of any of the hammers.

4,099,474

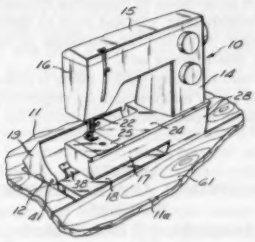
CONVERTIBLE OPEN-ARM SEWING MACHINE

Sidney J. Hamlett, Parma, and Charles M. Bell, Olmsted Falls, both of Ohio, assignors to White Sewing Machine Company, Cleveland, Ohio

Filed Dec. 6, 1976, Ser. No. 747,968

Int. Cl.[2] D05B *73/06*

U.S. Cl. 112—258 **7 Claims**



1. An assembly comprising a cabinet and a sewing machine, said cabinet including a cabinet panel having an upper horizontal surface and a cut-out for reception of said machine, said sewing machine including as components a frame and a pivot base, said frame having a vertical standard, a horizontal upper arm extending from the standard, a sewing head at the free end of the upper arm, a lower cantilevered arm freely extending from a supported end thereof adjacent the standard and generally parallel to the upper arm, means for pivoting the pivot base on the cabinet about a first horizontal axis parallel to said lower arm, said pivot base including a means for pivotally supporting the machine frame about a second axis spaced from and parallel to said first axis, said pivot base and said cabinet panel being arranged to support said machine frame at two vertically spaced operational positions corresponding to a free arm or first position wherein said lower arm is elevated with respect to said horizontal cabinet surface and a flat bed or second position wherein an upper face of said lower arm is generally coplanar with said horizontal cabinet surface, said pivot base extending generally along a longitudinal side of said frame, a generally planar surface carried by said pivot base, said planar surface being disposed relative to said pivot base and said frame such that it is generally coplanar with the upper surface of said lower arm when said frame is in said second

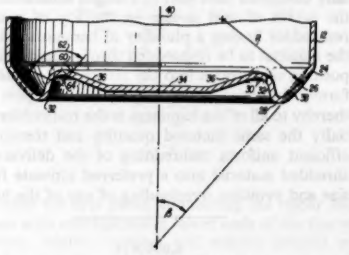
position whereby said planar surface forms an auxiliary work supporting surface, said planar surface being responsive to relative movement between said pivot base and said frame whereby said planar surface is displaced from said lower arm when said frame is in said first position.

4,099,475

METHOD OF TROUBLE-SHOOTING CAN PRESSES

Harry W. Lee, Jr., Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jul. 29, 1976, Ser. No. 709,904
Int. Cl.[2] B21D *51/26*
U.S. Cl. 113—116 QA **2 Claims**



1. A method of trouble-shooting a can press including the steps of:

producing cans from said press wherein said cans have a predetermined normal failure mode;

correlating given non-normal types of failure modes of said cans with given malfunctions of said can press;

subsequently selecting cans from said can press when said can press is believed to be operating normally and subjecting said subsequently selected cans to destructive testing to determine whether the resulting failure modes are normal or non-normal; and,

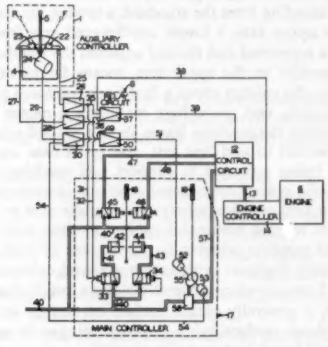
in the event said resulting failure mode is non-normal, determining the press malfunction corresponding to the non-normal failure mode determined during the previous step.

4,099,476

REMOTE CONTROL APPARATUS FOR MARINE ENGINES

Hiroo Inoue, Amagasaki, and Isao Kishimoto, Kobe, both of Japan, assignors to The Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Apr. 18, 1977, Ser. No. 788,397
Claims priority, application Japan, May 12, 1976, 51-54751
Int. Cl.[2] B63H *25/24*
U.S. Cl. 114—144 R **7 Claims**



1. In remote control apparatus for controlling direction and speed of a marine engine, synchronizing means for synchronizing operation of at least two operator controllers located remotely from each other, said synchronizing means comprising:

(a) an operator auxiliary controller selectively operable to a direction position for setting the direction of engine rotation, and to one of a plurality of speed positions for setting the rate of engine rotation by emitting respective electrical direction and speed control signals, said auxiliary controller including respective forward and reverse switch devices, one of which is actuated for producing said direction control signal according to the direction position to which the auxiliary controller is operated, and including a detector device for producing said speed control signal according to the speed position to which the auxiliary controller is operated;

(b) an operator main controller selectively operable, independently of said auxiliary operator controller, to a direction position for setting the direction of engine rotation, and to one of a plurality of speed positions for setting the rate of engine rotation by emitting respective direction and speed control signals;

(c) relay circuit means including respective forward and reverse amplifiers, one or the other of which receives the direction control signal from one or the other of the respective switch devices, depending upon the direction position of said auxiliary controller, and transmits such direction control signal to said main controller, and including a speed comparator for comparing the speed control signal produced by said detector device with the speed control signal emitted by said main controller,

(d) said main controller including positioning means responsive to said direction and speed control signals for effecting operation of said main controller to direction and speed positions corresponding to those of the auxiliary controller;

(e) engine controller means operable responsively to direction and speed control signals for effecting operation of the engine according to said control signals; and

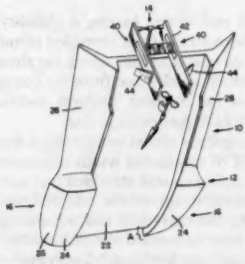
(f) control circuit means operably interposed between said main controller and said engine controller for transmitting said control signals from said main controller to said engine controller.

4,099,477

ENGINE POWERED WATER CRAFT

David W. Caldwell, Plant City, Fla. 33566

Filed Jul. 14, 1976, Ser. No. 705,090
Int. Cl.[2] B63B *1/26*
U.S. Cl. 114—281 **13 Claims**



1. An engine powered water craft comprising a hull including a pair of spaced apart hull elements configured to support said craft on the water in combination with a twin rudder system for directional control, said hull further comprising an upper and lower foil extending between said hull elements, said upper and lower foil intersecting rearward of the forward portion of said hull elements to cooperatively form a thin bow, said twin rudder system comprising a pair of rudders each

including a substantially vertical rudder element having a super cavitating foil element attached to the outer side thereof, each said super cavitating foil comprising a knife-like member extending in an angle from said substantially vertical rudder elements, said super cavitating foil elements configured to engage the surface of the water to support the rear portion of said water craft on the water at the intersection of said super cavitating foil elements and said substantially vertical rudder elements.

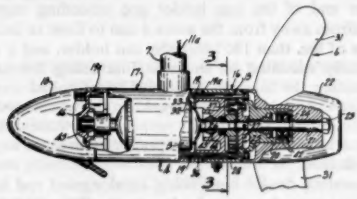
12. A super cavitating twin rudder system comprising a pair of rudders, each said rudder comprising a substantially vertical rudder element having a super cavitating foil element attached to the outerside, said rudders being vertically offset relative to each other to counteract engine torque, each said super cavitating foil element comprising a knife-like member extending upwardly at an angle from said substantially vertical rudder elements.

4,099,478

HIGH THRUST TROLLING MOTOR

Charles F. Alexander, Jr., Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 4, 1975, Ser. No. 610,304
Int. Cl.[2] B63H *21/28*
U.S. Cl. 115—18 E 7 Claims



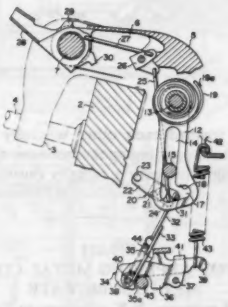
1. In an electric trolling motor having a lower unit secured to a tubular depending support, said lower unit including a cylindrical motor housing with an electric motor located therein and closed at the forward end, a generally cup-shaped housing means having an outer cylindrical portion corresponding to the cylindrical motor housing of said motor and having an inner planar base portion adjacent to the outer cylindrical portion, a motor shaft hub member having a cylindrical portion closely fitting within the outer cylindrical portion of the cup-shaped housing and having an inner end, an internally toothed annulus gear located between said base portion and said inner end of the cylindrical portion of the motor hub member, bolt means extending through said base portion and said annulus gear and threaded through said cylindrical portion of said hub member for firmly interconnecting said members, said base portion of said housing means and said hub member having opposed recesses to the opposite side of said annulus gear to define a gear chamber, a reduction gear means located in said chamber and including a planetary gear cage located within the recessed portion of the cup-shaped housing means and having a plurality of planetary gears meshing with the internally toothed annulus gear, a sun gear meshing with planetary gears, a propeller shaft rotatably journaled within said cup-shaped housing means and having the inner end fixed to said cage coaxially of the sun gear, said sun gear having a keying opening with a motor shaft having a keying end projecting therein, and a thrust bearing means between said cage and said sun gear to rotatably support said sun gear.

4,099,479

OUTBOARD MARINE PROPULSION UNIT

Tetsuya Arimitsu, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha and Yamaha Hatsudoki Kabushiki Kaisha, both of, Japan

Filed Feb. 25, 1977, Ser. No. 772,252
Claims priority, application Japan, Feb. 25, 1976, 51-19683
Int. Cl.[2] B63H *21/26*
U.S. Cl. 115—41 R 10 Claims



1. Outboard marine propulsion unit comprising clamp bracket means adapted to be secured to a boat hull, swivel bracket means pivotably mounted about an axis on said clamp means, and carrying a propulsion unit, tilt lock means for holding said swivel bracket means in a position raised with respect to a normal operating position, said tilt lock means including locking member means pivotably mounted on one of the clamp bracket means and the swivel bracket means and having elongated slot means, said slot means being formed at one end with locking recess means offset to one side of the slot means, locking pin means provided on the other of said clamp bracket means and said swivel bracket means and slidably engaging said slot means, biasing means for engaging said locking member means at a point for applying thereto a biasing force in such a direction that the locking recess means is forced into engagement with the locking pin means when the swivel bracket means is moved to the raised position and the locking pin means is slidably moved along the slot means to the end where the locking recess means is formed, restricting means adapted to engage said locking member means for applying thereto a biasing force which is larger than but opposite to the biasing force of the biasing means for restricting said locking member means against the movement under the biasing means, and control means for moving said restricting means into and from a position where the restricting means is engageable with said locking member means, said biasing means being independent from said restricting means and said control means so that said biasing means can always apply a biasing force to said locking member.

4,099,480

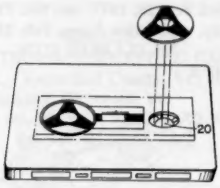
ROTATION INDICATORS FOR CASSETTE REELS

Louie E. Loustaunau, Los Angeles, Calif., assignor to Raymond Lee Organization, Inc., a part interest

Filed Sep. 30, 1976, Ser. No. 728,306
Int. Cl.[2] G01P *13/00*; G25B *27/00*
U.S. Cl. 116—135 2 Claims

1. Apparatus for use with a reel in a tape cassette comprising:
an indicator to be removably inserted in the center of a reel to enable the reel rotation to be observed, said indicator including a flat circular disc with a central hole, and a plurality of equidistantly spaced like flexible legs extending downwardly from the bottom of the disc from points located around the periphery of the hole, each leg having a projection means at its free end whereby each leg can be detachably secured to a corresponding spoke in the cas-

sette reel to maintain said indicator disc spaced from the reel, each leg being biased radially outwardly, each claw having two opposed fingers having curved inner surfaces



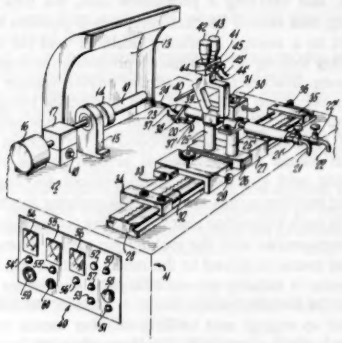
and biased toward each other whereby each claw can hold said corresponding spoke between the fingers, each finger having a tip with a radially outwardly projecting section.

4,099,481

APPARATUS FOR APPLYING METAL COATINGS TO A METAL SUBSTRATE

John E. Lyons, Levittown, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Sep. 30, 1976, Ser. No. 728,202
Int. Cl.[2] B05B *13/04*
U.S. Cl. 118—8 **24 Claims**



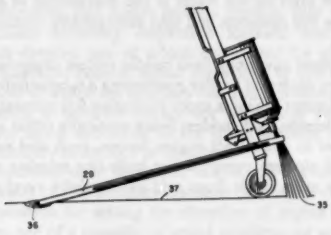
1. An automatic machine for applying metal coating to a generally cylindrical metal substrate, comprising a frame including work-holding means supported for rotation about an axis that is fixed with respect to said frame, drive means for rotating said work-holding means, a gas torch for operating upon work supported by said work-holding means, a carriage mounting said torch in position for discharge upon a local region of the supported work, guide means coacting between said carriage and frame for longitudinally guided traverse of said torch with respect to the work, recycling reciprocating drive means for imparting a predetermined repetitive traverse of the work by said torch; said torch comprising a discharge nozzle and means including a gas-flow valve for on-off supply of a gas flow to said nozzle, ignition means positioned adjacent said nozzle for igniting a gas-supplied nozzle discharge, spray-powder supply means, and means including a powder-flow valve for on-off control of a flow of spray powder for admixture with torch flow; and control means operative upon said reciprocating drive means and upon said respective valves and determining (a) a period of torch-reciprocation cycles while said powder-supply valve is in "off" condition, followed (b) by a period of torch-reciprocation cycles while said powder-supply valve is in "on" condition, said control means further determining an "on" condition of said gas-flow valve for at least the combined total of said periods.

4,099,482

MARKING APPARATUS WITH MEASURING DEVICE

Thomas J. Smrt, 31W 300 W. Bartlett Rd., Bartlett, Ill. 60103

Filed May 11, 1977, Ser. No. 795,712
Int. Cl.[2] B05C *17/00*
U.S. Cl. 118—9 **1 Claim**



1. In combination with a marking apparatus for making marks, a measuring device for measuring the distance between adjacent marks,

the marking apparatus including an elongated can holder having an upper end and a lower end, means on the can holder for supporting a valve-equipped aerosol can containing marking material, the axis of the can being parallel with the longitudinal dimension of the can holder, valve-opening means on the can holder for opening the valve of the aerosol can and spraying the marking material in a direction parallel with the longitudinal dimension of the can holder, a wheel-mounting bracket attached to the lower end of the can holder and extending angularly therefrom away from the aerosol can to form an included angle of less than 180° with the can holder, and a wheel rotatably mounted on the wheel-mounting bracket for permitting the marking apparatus to be rolled over the surface to be marked, whereby when the wheel-mounting bracket extends substantially perpendicular to said surface the marking material will be sprayed at an acute angle to said surface,

the measuring device comprising an elongated rod having first and second ends and a longitudinally extending slot extending from adjacent the first end of the rod toward the second end, the rod being pivotally and slidably connected to the can holder by a pin adjacent the lower end of the can holder and extending through the slot in the rod, a nut threadedly engaged with the pin whereby the rod and the can holder can be clamped together as the nut is tightened on the pin, the rod being pivotable when the nut is loosened on the pin between a storage position in which the rod extends alongside the can holder and a measuring position in which the second end of the rod extends away from the can holder and is engageable with the surface to be marked, the rod being releasably clamped in the measuring position by said nut whereby a series of equally spaced marks can be sprayed and the angle at which the marking material will be sprayed for each mark can be maintained constant by contacting said second end of the rod with a mark before the next mark is sprayed.

4,099,483

TISSUE PROCESSING APPARATUS

Kenneth James Henderson, Crowthorne, England, assignor to Shandon Southern Products Limited, Runcorn, England

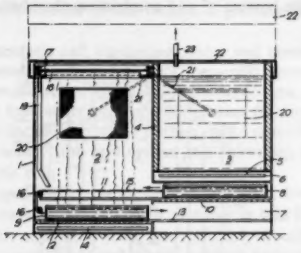
Filed Apr. 7, 1976, Ser. No. 691,585
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—49.1 **8 Claims**

1. Tissue processing apparatus comprising

(a) a vessel defining a vapor space;

(b) means for sealing the vapor space to enable the atmospheric pressure within the vapor space to be adjusted;

(c) a receptacle for a volatile processing liquid;
(d) heating means for vaporizing the processing liquid in the receptacle,
(1) the vapor space being arranged to receive the processing liquid vapor from the receptacle;
(e) means near an upper end of the vapor space for effecting condensation of the vapor in the upper vapor space end;
(f) means for returning the condensate to the receptacle;



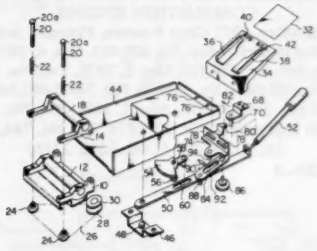
(g) an openwork basket adapted to hold tissue specimens to be processed;
(h) a wax bath; and
(i) suspension means adapted to hold the basket in the vapor space whereby tissue specimens held in the basket are exposed to the processing liquid vapor and to transport the basket from the vapor space into the wax bath for transferring the specimens from the vapor space to the wax bath.

4,099,484

PRESSURE FIXING APPARATUS FOR ELECTROPHOTOGRAPHY

Yukihiro Ohno, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1976, Ser. No. 693,442
Claims priority, application Japan, Jun. 10, 1975, 50-69179
Int. Cl.[2] B05C *11/02*
U.S. Cl. 118—117 **15 Claims**



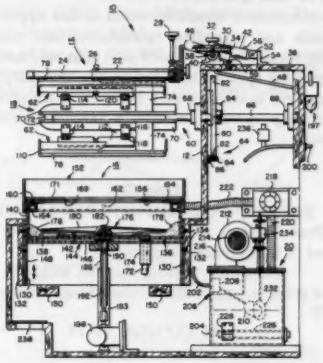
1. A pressure fixing apparatus for electrophotography comprising first and second pressure fixing rollers, biasing means pressing the rollers together, adjustor means operatively associated with the biasing means to adjust the latter and thereby the biasing force pressing the rollers together, entry means providing entry for sheets to the apparatus and being adjustable to sheets of different widths, and mechanism means operatively connected between the entry means and the adjustor means such that adjustment of the entry means to accommodate sheets of different width causes the mechanism means to adjust the adjustor means to vary the biasing force pressing the rollers together, whereby the biasing force pressing the rollers is a predetermined function of the width of the sheet in the entry means.

4,099,485

APPARATUS FOR APPLYING FLOCK TO A SUBSTRATE

Joseph E. Geary, Rochester; Joseph Pelensky, Perry, and John Peter Hart, Leicester, all of N.Y., assignors to Champion Products Inc., Rochester, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,608
Int. Cl.[2] B05B *15/04*
U.S. Cl. 118—301 **23 Claims**



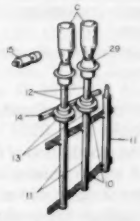
1. Apparatus for applying flock to a substrate comprising:
(a) a cabinet,
(b) means connected to said cabinet including a platen for supporting a substrate to be flocked,
(c) a flock tray positioned below said platen and including a bottom wall and side walls and means for moving said flock tray up and down in said cabinet and up into contact with said platen,
(d) sealing means located in said cabinet between said tray and said cabinet for preventing any flock from getting into said cabinet, and
(e) a flock tray cover having a bottom wall and located on top of said flock tray and having an opening in said bottom wall, and a removable mask having an opening therein and being located on top of said bottom wall of said flock tray cover.

4,099,486

ELECTROSTATICALLY COATING HOLLOW GLASS ARTICLES

Edward J. Bialorucki, Shippenville, Pa.; Ronald W. Bradley, Toledo, and David G. Carl, Sylvania, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 28, 1977, Ser. No. 781,603
Int. Cl.[2] B05B *5/02*
U.S. Cl. 118—635 **10 Claims**



1. Apparatus for electrostatically coating hollow glass articles having an opening leading into the interior, wherein the articles are supported adjacent the opening and electrostatically charged particles are directed toward the articles from at

least one side thereof, the improvement in the article support comprising:

a series of electrically, grounded vertical spindles;

means to rotate said spindles about their vertical axes and to simultaneously transport said spindles in series through the field of charged particles;

a spindle ground plug telescopically received in the upper end of each spindle;

a non-conductive chuck mounted to the upper end of the spindle and extending thereabove, said chuck further being formed with a lower skirt that surrounds that portion of the spindle that contains the ground plug; and

a ground pin in contact with said plug and having a portion extending upward through a central opening in said chuck.

4,099,487

ROLLER WITH ADJUSTABLE LENGTH

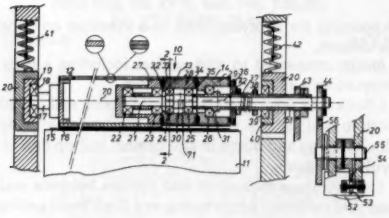
Albert Paul Wouters, Deurne, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Jun. 7, 1976, Ser. No. 693,550

Claims priority, application United Kingdom, Jun. 10, 1975, 24879/75

Int. Cl.² G03G *13/16*

U.S. Cl. 118—651 **13 Claims**



1. An adjustable rotatable pressure roller comprising a support shaft, a main roller section and at least one axially juxtaposed auxiliary roller section supported on said shaft, said auxiliary roller section having a diameter less than that of said main roller section, and adjustable means for bodily displacing said auxiliary roller section radially upon said shaft to adjust the position of its axis of rotation in parallel relation to the position of the axis of rotation of said main roller section.

4,099,488

DIESEL FUELED ENGINE COOLANT HEATER

Ralph S. Damon, Cleveland, Ohio, assignor to Hunter Investment Company, Cleveland, Ohio

Filed Jun. 9, 1975, Ser. No. 584,948

Int. Cl.² F22B *7/00*; F23N *1/08*

U.S. Cl. 122—156 **23 Claims**

1. A coolant fluid heater comprising in combination:

a combustion chamber;

a fuel-primary air injection nozzle supported by a burner head;

an air spread cup;

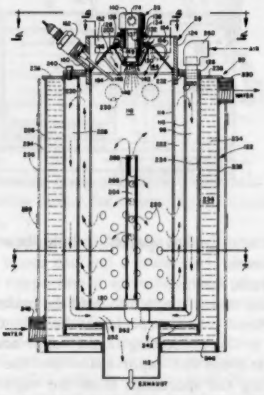
first supply means to admit fuel and primary air, under pressure, to said nozzle;

means providing for the atomization of fuel at said nozzle for the introduction of a fuel-primary air mixture into said combustion chamber through said air spread cup;

said fuel-primary air mixture being admitted into said combustion chamber in substantially a conical pattern having an axis substantially coincident with the axis of said nozzle;

second supply means providing for the introduction of secondary air into said combustion chamber, said second supply means providing for the passage of secondary air in a rotating pattern about said nozzle and into said combustion chamber substantially outside of said conical pattern;

third supply means providing for the introduction of tertiary air into said combustion chamber, said tertiary air being admitted into said combustion chamber at a location spaced apart and downstream from said nozzle and on approximately the center line thereof so as to be introduced within said conical pattern at a location approximately midway between the discharge end of said nozzle and the bottom of said combustion chamber;



said secondary air and said tertiary air contributing to complete combustion of said fuel both inside and outside of said conical pattern;

ignition means in said combustion chamber to ignite fuel and air in said combustion chamber to provide for combustion therein;

means to pass coolant fluid in heat exchange relationship to the products of combustion generated in said combustion chamber.

4,099,489

FUEL REGENERATED NON-POLLUTING INTERNAL COMBUSTION ENGINE

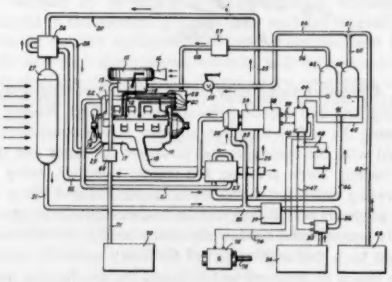
Curtis E. Bradley, 4517 Calle Ventura, Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 620,021, Oct. 6, 1975, Pat. No. 4,003,204, Ser. No. 620,022, Oct. 6, 1975, Pat. No. 4,003,344, and Ser. No. 620,023, Oct. 6, 1975, Pat. No. 4,003,345, each is a division of Ser. No. 456,974, Aug. 1, 1974, Pat. No. 3,939,806.

This application Nov. 22, 1976, Ser. No. 744,193

Int. Cl.² F02B *43/08*; F01K *23/10*

U.S. Cl. 123—3 **11 Claims**



1. In an internal combustion engine;

(a) an engine block providing at least one combustion chamber;

(b) an exhaust pipe extending from said block;

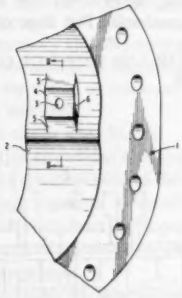
(c) a partially closed system for a working fluid in the form of water and gas emanating therefrom by heating of the water and including a pump for circulating the working fluid through the system, a turbine which is operated by the working fluid in a gaseous state, and a condenser for returning the working fluid from a gaseous state to water;
(d) a heat exchanger disposed about said exhaust pipe and through which said working fluid system passes to derive heat from said exhaust pipe and heat the working fluid;
(e) a generator driven by said turbine to produce an electric current;
(f) an electrolysis cell containing water and connected to said generator whereby current from said generator decomposes the water into oxygen and hydrogen;
(g) a water tank connected to said working fluid system by a conduit including a water purifier, and a piper for taking purified water from said system and delivering it to said electrolysis cell;
(h) a hydrogen carburetor on said engine block for delivering hydrogen to a combustion chamber in said block;
(i) a conduit extending from said electrolysis cell to said hydrogen carburetor and which conveys hydrogen from said cell and delivers it to said hydrogen carburetor under pressure by the heat of said cell and the pump which circulates the working fluid;
(j) a fuel tank for a hydrocarbon fuel;
(k) a hydrocarbon fuel carburetor on said engine block and connected to said hydrocarbon fuel tank; and
(l) means for conveying oxygen from said electrolysis cell and delivering it under pressure to said combustion chamber by pressure generated by said cell and the pump which circulates the working fluid.

4,099,490

METHOD FOR PRODUCING A HOUSING CASING FOR A ROTARY PISTON INTERNAL COMBUSTION ENGINE

Helmut Dobler, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 328,534, Feb. 1, 1973, Pat. No. 3,892,082. This application Nov. 12, 1974, Ser. No. 523,046
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1972, 2204560
Int. Cl.[2] F02B *53/00*
U.S. Cl. 123—210 **9 Claims**



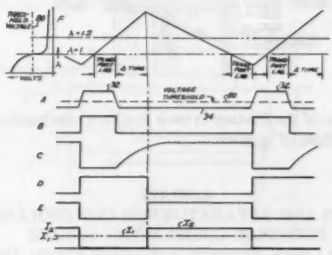
1. A housing casing for a rotary piston internal combustion engine which consists essentially of light metal and which includes a coating of hard material for a piston running surface with a spark-plug-firing channel means terminating in a discharge opening in said running surface, characterized in that the area about the discharge opening of the spark-plug-firing channel means is constituted by a material island of said light metal whose height corresponds to a thickness of the coating provided at an inner contour of the housing casing in a machined condition so that the coating of harder metal commences only at a distance from the spark-plug firing channel means.

4,099,491

SYSTEM CONTROLLING ANY AIR/FUEL RATIO WITH STOICHIOMETRIC SENSOR AND ASYMMETRICAL INTEGRATION

Junuthula Nirdosh Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 553,050, Feb. 25, 1975, abandoned. This application Apr. 26, 1977, Ser. No. 791,092
Int. Cl.[2] F02B *3/00, 75/10;* F02D *5/02*
U.S. Cl. 123—32 EE **28 Claims**



1. In a fuel management system supplying fuel to an internal combustion engine at an average air/fuel ratio comprising:
fuel control means for varying the quantity of fuel supplied to the internal combustion engine to effect the average air/fuel ratio,
an exhaust gas sensor positioned in the exhaust system of the internal combustion engine said sensor adapted to generate an electrical signal switching from a first voltage level to a second voltage level when the instantaneous air/fuel ratio of the exhaust gas mixture exceeds a predefined air/fuel ratio,
means for maintaining a difference between said predefined air/fuel ratio and the average air/fuel ratio, said means including an integrator means responsive to said electrical signal generated by said sensor for generating an output signal to said fuel control means having alternate positive and negative-going slopes the absolute value of the positive-going slope being different than the absolute value of the negative-going slope;
whereby said difference in said slopes causes said system to operate at the average air/fuel ratio while responsive to said sensor switching at said predefined air/fuel ratio.

4,099,492

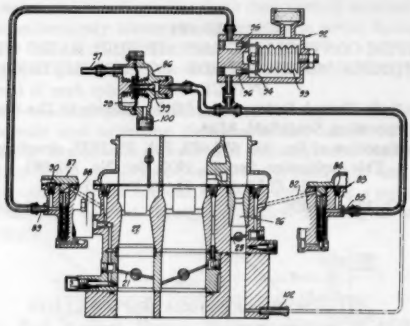
MIXTURE CORRECTION SYSTEM DURING RAPID ACCELERATION IN INTERNAL COMBUSTION ENGINE WITH AUXILIARY COMBUSTION CHAMBER

Urataro Asaka, Kamifukuoka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1977, Ser. No. 763,851
Claims priority, application Japan, Feb. 4, 1976, 51-10266
Int. Cl.[2] F02B *3/00, 19/10, 19/16*
U.S. Cl. 123—32 ST **17 Claims**

1. In an internal combustion engine in which each piston is provided with a main combustion chamber having an auxiliary combustion chamber associated therewith and connected thereto by means of a torch opening, and a spark plug associated with each auxiliary combustion chamber, the improvement comprising, in combination: means including a main throttle valve for supplying a relatively lean mixture to each of said main combustion chambers, means including an auxiliary throttle valve for supplying a relatively rich mixture to each of

said auxiliary combustion chambers, and correction means responsive to sudden acceleration of the engine for reducing



the richness of the mixture in each auxiliary combustion chamber at the time of ignition.

4,099,493

METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

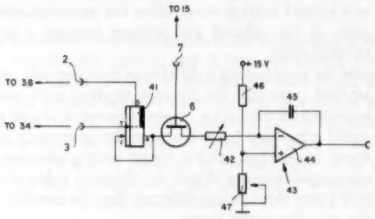
Reinhard Latsch, Vaihingen, and Valerio Bianchi, Hochdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 597,404, Jul. 18, 1975, abandoned. This application Mar. 5, 1976, Ser. No. 664,396

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1975, 2509505

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **3 Claims**



1. A method for controlling the operation of an internal combustion engine, comprising the steps of:

(A) determining the scattering of the cyclic fluctuations of the average combustion chamber pressure during time intervals which are synchronous with the engine r.p.m. and generating a first signal representative thereof;

(B) generating a second signal representative of engine r.p.m. but not including dependence on said fluctuations;

(C) performing a phase comparison of said first and second signals and generating a comparison signal representative of this phase comparison;

(D) feeding said comparison signal to a final control element for adjusting the fuel-air ratio of the fuel-air mixture admitted to the internal combustion engine; and

(E) interrupting the feeding of said comparison signal to said final control element whenever said phase comparison indicates changes in engine acceleration toward increasing values of acceleration, but maintaining the feeding of said comparison signal to said final control element whenever said phase comparison indicates changes in engine acceleration toward decreasing values of acceleration; whereby the fuel-air mixture remains unchanged during positive changes in engine acceleration.

4,099,494

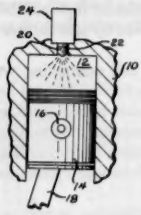
FUEL SPRAY

Alexander Goloff, East Peoria, and Frank E. Keske, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 19, 1976, Ser. No. 733,974

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 JV **13 Claims**



1. In an internal combustion engine having a working chamber, a piston movable within said chamber, a fuel injection nozzle within the chamber, and a means for providing fuel under pressure to said nozzle, the improvement wherein said nozzle includes an element having a hollow interior in fluid communication with said fuel providing means, and at least one slit in said element, the sides of said slit being in abutment with each other for fuel pressures in said interior less than a predetermined value, said sides being spaced from each other to permit fuel to flow from said interior in response to fuel pressures within said interior greater than said predetermined value.

4,099,495

METHOD AND APPARATUS TO DETERMINE THE TIMING OF A PERIODICALLY REPETITIVE EVENT WITH RESPECT TO THE POSITION OF A ROTATING BODY, AND MORE PARTICULARLY IGNITION TIMING, FUEL INJECTION TIMING, AND THE LIKE, IN AUTOMOTIVE INTERNAL COMBUSTION ENGINES

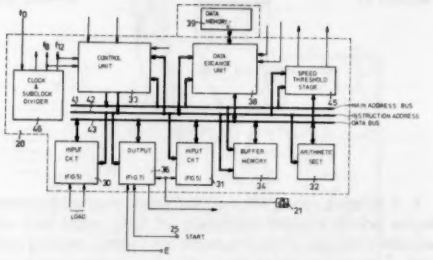
Uwe Kiencke, Ludwigsburg; Ulrich Flaig, Markgroningen; Martin Zechnall, Schwieberdingen, and Günter Hönig, Markgroningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 719,068

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539113

Int. Cl.[2] F02B *3/00*; F02P *5/04*; G06F *15/20*

U.S. Cl. 123—32 EB **16 Claims**



1. System to determine the timing of a periodically repetitive event with respect to a predetermined angular reference position of a rotating body of an apparatus, in which said timing is determined as a function of an operating parameter of the apparatus, the timing of the periodically repetitive event, with respect to said predetermined reference position of the body

being controlled by a square wave electrical signal having a leading flank, the time occurrence of which, with respect to said predetermined reference position, is obtained by a first computation,

and a trailing flank, the time occurrence of which with respect to the leading flank thereof is obtained by a second computation based on the timing of the leading flank with respect to said predetermined reference position,

said system comprising

means providing clock control signals

a transducer means (21) generating a first marker signal related to the predetermined reference position of the body in the apparatus, and further generating a second marker signal relating to rotation of said body over a predetermined angular interval beyond said predetermined reference position;

and a digital data processing system carrying out said first computation and calculating, during time intervals related to angular intervals of rotation of said body beyond said predetermined reference position, digital electrical control signals having calculated values which are representative, in digital form, of operating parameters related to and characterizing the operation of the apparatus;

counter and count decode logic means (80, 81) carrying out said second computation and establishing, by timed sequential counting of said clock control signals, in intervals subsequent to said first marker signal, the temporal relationship between the angular position of the rotating body and said event under control of said calculated digital electrical control signals, wherein the digital processing system carrying out said first computation, and the counter and decode logic means (80, 81) counting and thereby carrying out said second computation, are operating simultaneously, independently from each other, and during time overlap;

and wherein said data processing system and said counter and decode logic means (80, 81) includes

separate units comprising a main control unit (33);

an arithmetic unit (32) to carry out all calculations including calculation of the occurrence, in time, of said leading flank and the trailing flank of said square wave electrical signal;

a data exchange control unit (38);

an external data memory unit (39) storing the relationship or function between change in operating parameters of the apparatus and the timing of the event;

a buffer memory unit (38);

at least one input circuit unit (30, 31);

at least one output circuit unit (36), the output circuit unit (36) providing a voltage pulse in the form of said square wave electrical signal as a function of the angle of rotation of said body from said predetermined reference and as a function of at least one of said operating parameters of the apparatus;

and a bus system (41, 42, 43) interconnecting said units (33, 32, 38, 39, 34, 30, 31, 36), said main control unit also controlling selective connection of said external data memory (39) to said bus system to supply data to said bus system, said data exchange unit (38) and said arithmetic unit (32).

4. System according to claim 1, wherein said apparatus comprises an automotive internal combustion engine, and the data stored in the data memory (39) store the function or relationship between engine operating parameters and the timing of a voltage pulse controlling at least one of the operations of the engine: ignition; fuel injection.

4,099,496

CARBURETOR HEAT SHIELD

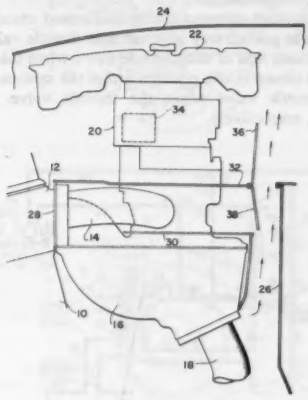
Hidenobu Nagase, Wako; Eiji Kishida, Tokyo, and Mitsuji Yoshihara, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 735,952

Claims priority, application Japan, Oct. 27, 1975, 50-145281[U]

Int. Cl.[2] F02M *31/00;* F02B *19/10*

U.S. Cl. 123—41.31 2 Claims



1. An intake system for an automobile engine, including a carburetor having a float chamber and an intake manifold, said carburetor being mounted on top of said intake manifold, said intake manifold being of a type employed directly above an exhaust manifold, the improvement comprising: a first heat insulating plate positioned between the carburetor and the intake manifold in a substantially horizontal orientation, said first plate being capable of covering at least substantially all of the area above an exhaust manifold with which the intake maifold is to be associated, a second plate extending substantially vertically from an edge of said first plate most distant from said engine, to at least about the height of said float chamber and a third plate extends downwardly from said edge of said first plate most distant from said engine.

4,099,497

INTERNAL COMBUSTION ENGINE HAVING EXHAUST EMISSION CONTROL SYSTEM

Haruo Mori, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,159

Claims priority, application Japan, Dec. 26, 1974, 50/2336

Int. Cl.[2] F02P *5/04;* F02M *25/06*

U.S. Cl. 123—117 A 10 Claims

1. An internal combustion engine, comprising

an intake passageway having a throttle valve,

an exhaust pipe operatively communicating with said intake passageway downstream of the latter via the engine,

a distributor,

a vacuum actuator including a first diaphragm means defining an advance chamber and a retard chamber,

said first diaphragm means being operatively connected to said distributor for controlling spark timing,

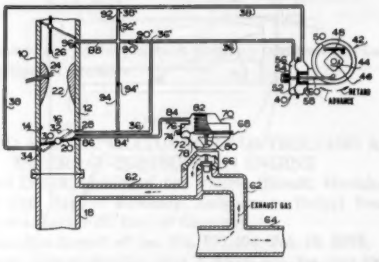
an exhaust gas recirculation system further operatively communicating said exhaust pipe to said intake passageway at a point of the latter downstream of said throttle valve,

said exhaust gas recirculation system comprising, a recirculation control valve means for opening and closing, respectively, communication of said exhaust pipe with said intake passageway via said exhaust gas recirculation system, a second diaphragm means operatively connected to

said recirculation control valve means for controlling the latter, said second diaphragm means defining a vacuum chamber, and a spring means for biasing said second diaphragm means so as to close said recirculation control valve means,

a first conduit communicating said advance chamber with said intake passageway adjacent said throttle valve at an upstream side of said throttle valve when said throttle valve is closed in idle position and at a downstream side of said throttle valve when the throttle valve is partly opened, respectively,

a second conduit communicating said retard chamber with said intake passageway adjacent said throttle valve at the downstream side of said throttle valve when said throttle valve is closed in idle position and at the upstream side of said throttle valve when the throttle valve is partly opened, respectively,



a third conduit communicating said vacuum chamber of said exhaust gas recirculation system with said intake passageway adjacent said throttle valve at the upstream side of said throttle valve when said throttle valve is closed,

a first branch conduit communicating said first conduit with atmosphere,

a second branch conduit communicating said second conduit with atmosphere,

a third branch conduit communicating said third conduit with atmosphere, and

a flow restricting means provided in each of said branch conduits for restricting flow therethrough, respectively, all said flow restricting means being constructed as a single unit and replaceably mounted with respect to said branch conduits, respectively.

4,099,498

CONTACTLESS IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

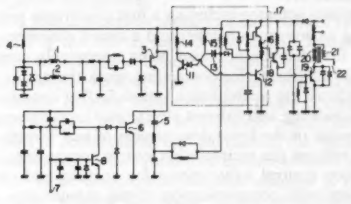
Toshiyuki Sasaki, Nakamachi, Japan, assignor to Hitachi, Ltd., Japan

Continuation of Ser. No. 474,028, May 28, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,123

Claims priority, application Japan, May 30, 1973, 48-59786

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 R **7 Claims**



1. A contactless ignition apparatus for an internal combustion engine having an ignition circuit, said apparatus comprising:

first and second pickup coils for detecting different ignition timing points, said first and second pickup coils being so arranged that each of said first and second pickup coils produces an output necessary for actuating said ignition circuit, said first pickup coil being so arranged as to detect the lag angle ignition timing point, said second pickup coil being so arranged as to detect the lead angle ignition timing point, and

first means for introducing selectively one of the respective outputs of said first and second pickup coils to said ignition circuit thereby to control ignition timing, said first means including second means for rendering ineffective the output of said second pickup coil, in response to an external signal representing the running condition of the engine to which said apparatus is coupled, when said external signal indicates that the running condition of the engine requires ignition at the lag angle position timing point, said second means including a first switching transistor, the collector-emitter circuit of said first switching transistor being connected in parallel to the output of said second pickup coil, the base current of said first switching transistor being controlled in response to the external signal representing the running condition of the engine to which said apparatus is coupled thereby to control the on-off operation of said first switching transistor.

4,099,499

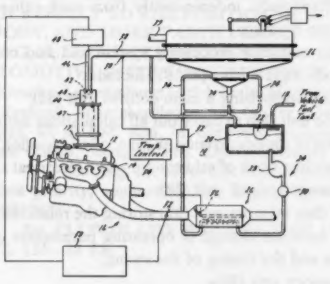
VAPOR TEMPERATURE CONTROLLED EXHAUST GAS HEAT EXCHANGER

Dante S. Giardini, Dearborn Heights, and Douglas R. Hamburg, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 21, 1976, Ser. No. 699,004

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—122 E **2 Claims**



1. The method of providing a vaporized liquid fuel to an internal combustion engine, comprising the steps of:

providing a closed flow of fluid fuel from a liquid fuel reservoir means to a fuel vapor storage means;

generating a flow of heated gaseous medium;

causing said gaseous medium to flow in heat exchange relation to the flow of fluid fuel at a location intermediate the storage means and the reservoir means and at a temperature sufficient, considering minimum fluid fuel dwell time, to heat and completely vaporize the liquid fuel;

sensing a fuel temperature downstream, in the fuel flow direction, from the fuel heating location;

modulating the heat exchange transfer rate between the gaseous medium flow and the fluid fuel in response to sensed temperature whereby the temperature of the generated fuel vapor may be maintained within a desired range;

sensing the quantity of fuel vapor resident in the vapor storage means; and

modulating the heat exchange transfer rate between the fluid fuel flow and the gaseous medium flow in response to

sensed vapor quantity whereby the quantity of fuel vapor within the vapor storage means may be maintained within a desired range.

4,099,500

EXHAUST SYSTEM FOR INTERNAL COMBUSTION ENGINE

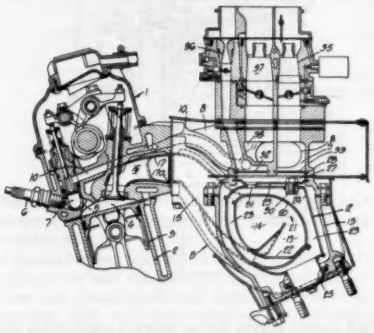
Soichi Nakano, Kawagoe; Yasumichi Ohama, Mitaka, and Masao Watanabe, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1975, Ser. No. 596,411

Claims priority, application Japan, Jul. 22, 1974, 49-83287

Int. Cl.[2] F02B *19/10*

U.S. Cl. 123—122 AB **5 Claims**



1. In a multi-cylinder internal combustion engine, the combination of: means including exhaust ports in the engine leading from combustion chambers, at least two of said exhaust ports being positioned as an adjacent pair, and exhaust manifold provided with at least one exhaust collection pipe, said adjacent pair of exhaust ports having a single thin-wall metallic liner positioned within both exhaust ports, said liner being formed of heat resistant metal of low thermal capacity, said liner having one exit opening communicating with said exhaust collection pipe.

4,099,501

POLLUTION REDUCING AND FUEL SAVING DEVICE

Robert D. Fairbanks, and Roger D. Fairbanks, both of P.O. Box 298, Haines, Ak. 99827

Filed Feb. 10, 1977, Ser. No. 767,551

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—122 E **10 Claims**

1. A pollution reducing and fuel saving device adapted for use in conjunction with liquid-cooled internal combustion engines including a carburetor or fuel injector and a fuel supply tube for conducting fuel to the carburetor or fuel injector, a radiator, and flow lines extending from the radiator to the liquid circulating jacket of the engine, said device comprising:

(A) a housing of heat conductive metal, said housing including:

(1) a central body portion,

(2) a base portion, and

(3) a cap portion, each having abutting face-to-face planar surfaces,

(4) fastening means for securing said body portions together, and

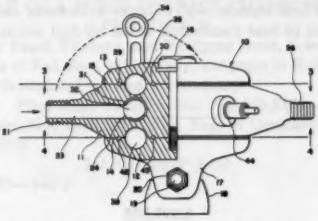
(5) sealing means between the abutting face-to-face planar surfaces of adjacent body portions,

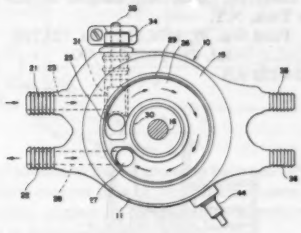
(B) a radiator liquid inlet fitting and a radiator liquid outlet fitting on one side of said central body portion to connect into the radiator liquid flow of a radiator,

(C) a first curvilinear radiator liquid flow channel formed in the interface between said central body portion and one of said other body portions,

(D) a pair of further radiator liquid flow channels in said central body portion connecting said radiator liquid fittings with the ends of said first curvilinear flow channel.

(E) a fuel inlet fitting and a fuel outlet fitting on the opposite side of said central body portion to connect to a fuel supply line between a fuel pump and carburetor or fuel injector,





(F) a second separate curvilinear fuel flow channel formed in the interface between said central body portion and the other of said other body portions adjacent to but spaced from said first curvilinear flow channel,

(G) a pair of further fuel flow channels in said central body portion connecting said fuel fittings with the ends of said second curvilinear flow channel, and

(H) means for mounting said housing.

4,099,502

MANIFOLD ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

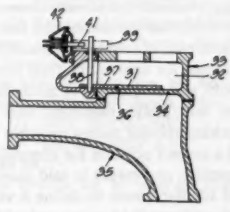
Takao Okura, Ooimachi; Eiichi Hashimoto, Niiza, and Yasumichi Ohama, Mitaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,394

Claims priority, application Japan, Aug. 4, 1975, 50-94187; Aug. 4, 1975, 50-107120

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—122 AC **9 Claims**



1. In a manifold assembly for an internal combustion engine having an intake manifold for delivering an air-fuel mixture for combustion in the engine and an exhaust manifold for receiving hot exhaust gases from the engine, the combination of: heat

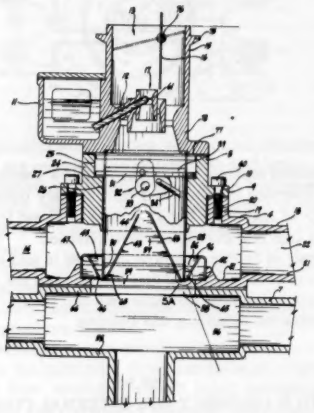
exchange means including a stationary heat transfer wall operatively positioned between said manifolds whereby the air-fuel mixture may be heated by the hot exhaust gases, a movable element mounted in said intake manifold in contact with said heat transfer wall, and means pivoting said movable element at right angles to said heat transfer wall so as to uncover and cover said heat transfer wall in order to increase and decrease the amount of heat transferred to the air-fuel mixture.

4,099,503

MEANS FOR IMPARTING SUPERSONIC FLOW CHARACTERISTICS IN THE INTAKE MANIFOLD OF AN INTERNAL COMBUSTION ENGINE

Edward H. Casey, St. Louis, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,719
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 AB **11 Claims**



1. A fuel supply system for an internal combustion engine, comprising:

an intake manifold for distributing fluid to the engine, said manifold having an enclosure, said enclosure defining at least one fluid passage in said manifold;

a carburetor for supplying a fuel/air mixture to said intake manifold, said carburetor having an air passage in it operatively connected to the fluid passage of said intake manifold, fuel supply means operatively connected to said air passage, and means for combining the fuel and air in said air passage upstream of said intake manifold; and

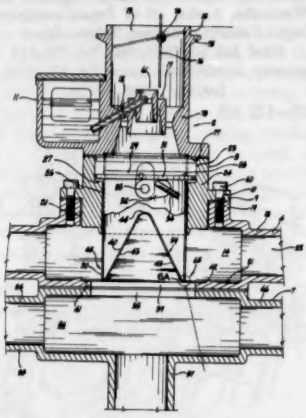
throttle valve means for controlling fluid flow through said intake manifold, said throttle valve means having an outlet positioned in said intake manifold, said throttle valve means comprising tubular means movable between a first position and a second position for controlling the area of the outlet opening, and means in said manifold for coacting with said tubular means to define a valve opening in said manifold, said manifold means and said tubular means together defining a converging section, a restriction, and a diverging section for fluid flow, said converging, restriction and diverging sections creating supersonic fluid flow conditions in said manifold in at least one operating position of said tubular means.

4,099,504

THROTTLE STRUCTURE FOR AN INTERNAL COMBUSTION ENGINE

James T. Bickhaus, St. Louis, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,713
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 AB **19 Claims**



1. A fluid supply system for an internal combustion engine, comprising:

an intake manifold, said intake manifold including an enclosure, said enclosure defining a plurality of fuel ports and a distribution passage, said intake manifold having at least one opening in it for communicating with a carburetor, said inlet manifold including a bottom wall;

a carburetor, said carburetor having a main air passage communicating with the opening in said intake manifold and said distribution passage, means for injecting fuel into said main air passage, and a throttle structure operable from a fully closed to an open position for controlling fluid flow through said intake manifold in response to demands made on said engine, said throttle structure being mounted to said carburetor so as to extend into said intake manifold, said throttle structure having an outlet side in said intake manifold.

4,099,505

FUEL INJECTION SYSTEM

Gerhard Stumpp, Stuttgart; Wolf Wessel, Oberriexingen, and Volkard Stein, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 11, 1976, Ser. No. 694,984
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1975, 2529701
Int. Cl.² F02M *69/00*
U.S. Cl. 123—139 AW **16 Claims**

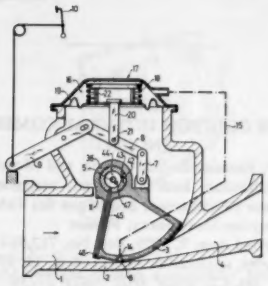
1. In a fuel supply system for an internal combustion engine, said engine including an air induction tube, means for fuel injection into said induction tube, fuel metering means, a throttling element located in said induction tube and coupled to said fuel metering means to control fuel injection as a function of air flow through said induction tube, and an accelerator pedal, the improvement comprising:

a shaft mounted in said induction tube and having an axis transverse to the direction of air flow in said induction tube, said throttle element is a body disposed to pivot about said shaft, a surface of said body remote from said pivotal axis is substantially cylindrical and is adapted to cooperate with the interior wall of said induction tube to form therewith an air flow aperture of varying cross

section, and said throttle element can be rotated by linkage attached to the accelerator pedal of the engine;

pressure means, responsive to the static air pressure prevailing in the vicinity of said air flow aperture, coupled to said throttle element, for independent displacement thereof;

said fuel metering means is constituted by said pivotal shaft and by portions of said throttle element cooperating therewith such that the magnitude of injected fuel depends on



the relative position of said pivotal shaft and said throttle element which together define a fuel metering slot of variable size; and

said means for fuel injection is a nozzle in said body located adjacent to said substantially cylindrical surface remote from said pivotal shaft, said nozzle being in fluid communication with said fuel metering slot; whereby fuel is injected into said induction tube at a location where the air flow velocity is a relative maximum.

4,099,506

IDLING ABUTMENT FOR THE GOVERNOR OF AN INJECTION PUMP OF AN AIR-COMPRESSING INTERNAL COMBUSTION ENGINE

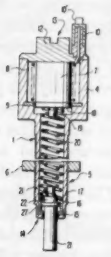
Ulrich Kolb, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 24, 1976, Ser. No. 744,866

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553560

Int. Cl.² F02D *1/02*; F02M *39/02*

U.S. Cl. 123—140 J **21 Claims**



14. In an arrangement for the control of the quantity of fuel supplied by an injection pump of an air-compressing internal combustion engine of the type wherein a heat-expansible means acts upon a displaceable abutment member which is operable upon a quantity adjustment member of the injection pump for altering the quantity of fuel supplied by said pump, the improvement comprising:

electrical heating means for causing an expansion of said heat expansible means; and

storage means for enabling said heat expansible means to expand in length without causing said abutment member to be displaced until a predetermined temperature is reached, and for enabling displacement of said abutment member by said heat expansible means after said predetermined temperature is reached.

4,099,507

METHOD AND SYSTEM TO CONTROL THE DUTY CYCLE OF A PULSE VOLTAGE CHANGING IN FREQUENCY

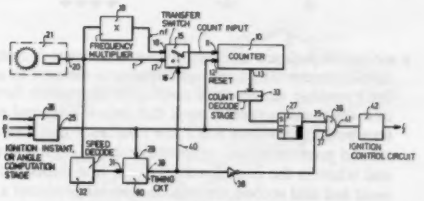
Ernst-Olav Pagel, Freiberg, and Wolfgang Borst, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 24, 1976, Ser. No. 669,814

Claims priority, application Fed. Rep. of Germany, May 27, 1975, 2523388

Int. Cl.² F02P *5/04*

U.S. Cl. 123—148 E **18 Claims**



1. Method to control the relationship between ON and OFF-time of ignition current flow in the ignition system of an internal combustion engine by providing a sequence of pulses which vary in frequency comprising

generating first and second pulse sequences as a function of engine speed in which the first and second pulse sequences have different repetition rates or frequencies;

accumulating in a counter (10) the pulses of the first pulse sequence (*nf*) and then of the second pulse sequence (*f*);

generating a timing interval and controlling the accumulation of the first pulse sequence as a function of time;

computing a theoretically optimum ignition instant and providing a control signal representative of said optimum ignition instant;

setting the counter (10) to a number determined by said control signal and representative of said optimum ignition instant to thereby

determine the count state of the counter at a predetermined time ($t_o + t_r$) after the counter has started to accumulate the pulses of said first and second frequencies;

and providing an output pulse having a pulse duration (t_s) and a pulse cycling time ($t_o + t_r + t_s$) controlled by the count state of the counter at said predetermined time with respect to a reference number.

4,099,508

IGNITION SYSTEM

Yoshikazu Noguchi; Katsuyuki Senda, and Mamoru Kobashi, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 20, 1976, Ser. No. 688,465

Claims priority, application Japan, Nov. 21, 1975, 50-158128[U]; Nov. 21, 1975, 50-158129[U]

Int. Cl.² F02P *3/04*

U.S. Cl. 123—148 DC **5 Claims**

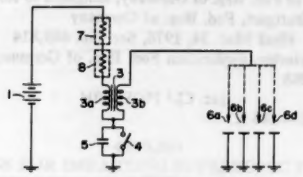
1. An ignition system for an internal combustion engine comprising:

a source of direct current power;

an ignition coil having primary and secondary windings;

a first impedance element whose impedance is temperature dependent, said first impedance element being coupled between said source of direct current power and said

primary winding of said ignition coil and comprising a negative temperature coefficient thermistor having a two value temperature coefficient characteristic such that below some predetermined temperature it is a high resistance and above some predetermined temperature it is a low resistance whereby the primary current flowing through said primary winding of said ignition coil is not decreased as the direct current resistance of the ignition coil increases with temperature; and



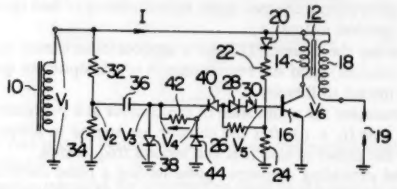
a second impedance element whose impedance is temperature dependent, said second impedance element comprising a positive temperature coefficient thermistor having a two value characteristic such that below a second predetermined temperature it is a low resistance and above said second predetermined temperature it is a high resistance, and wherein the combination of said first impedance element and said second impedance element produces a three value temperature coefficient characteristic.

4,099,509

IGNITION SYSTEMS OF CURRENT INTERRUPTION TYPE FOR INTERNAL COMBUSTION ENGINES

Hideyuki Hashimoto, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Jun. 23, 1976, Ser. No. 699,183
Claims priority, application Japan, Jul. 4, 1975, 50-81803
Int. Cl.[2] F02P *1/08*
U.S. Cl. 123—148 AC **11 Claims**



1. An ignition system of a current interrupting type for an internal combustion engine, comprising:

an a.c. power source,

an ignition coil including a primary winding connected to said a.c. power source,

a controlled switch element for interrupting the current flowing through said primary winding, and

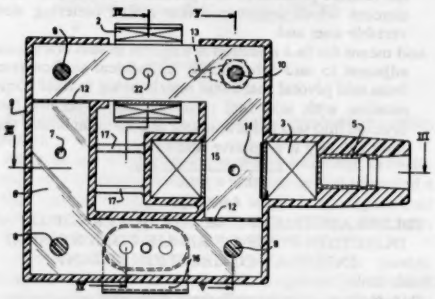
a control means for operating said controlled switch element thereby to interrupt the current fed to said primary coil in synchronism with a required ignition cycle of said engine in dependence on the output of said a.c. power source, said control means including means for synchronizing said current interrupting operation of said switch element with occurrence of peak value of the output current from said a.c. power source, said synchronizing means including a capacitor, a charging circuit for coupling said capacitor across the output of said a.c. power source to charge said capacitor with said output current and a discharging circuit coupled to said capacitor for discharging the same, said discharging circuit being adapted to be actuated in response to the occurrence of the peak of said output current from said a.c. power source thereby to initiate the discharge of said capacitor, and wherein said control means includes a semiconductor switching element connected between said capacitor and said switch element for the current interruption, said semiconductor switching element being so arranged as to respond to the operation of said discharging circuit thereby actuating said current interrupting switch element to effect the current interruption.

4,099,510

IGNITION COIL FOR INTERNAL COMBUSTION ENGINE

Pierre Perrier, Ramonville-Saint Agne, and Maurice L. Razet, Issy-les-Moulineaux, both of France, assignors to Societe Anonyme pour l'Equipement Electrique des Vehicules S.E.V. Marchal, Issy-les-Moulineaux, France

Filed Aug. 9, 1976, Ser. No. 712,964
Claims priority, application France, Aug. 14, 1975, 75 25324
Int. Cl.[2] F02P *3/02*; H01F *27/30*
U.S. Cl. 123—148 D **11 Claims**



1. An internal combustion engine ignition coil comprising

a rectangular magnetic core having a median line in a single plane and consisting essentially of a stack of sheets of magnetic material, each layer of which is formed from two substantially identical L-shaped members each having two arms of the same width, so that there are two stacks of L-shaped members in which the corners of the L-shaped members are superimposed;

said rectangular core being devoid of magnetic shunt elements, said core having only one primary inductive winding and only one secondary high voltage winding thereon;

said primary inductive winding on one arm of one stack of L-shaped members, and said secondary high voltage winding on the other arm of said one stack;

said primary winding having a length L parallel to said one arm, and a thickness perpendicular to said one arm which is in the range between L/50 and L/8;

said secondary winding having a length l parallel to said other arm, and a thickness perpendicular to said other arm which is in the range of between l and 6l;

a plane through one end of one of said windings perpendicular to its arm intersecting both ends of the other winding.

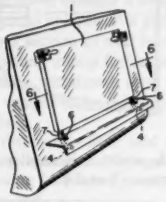
7. Coil as claimed in claim 1 in which one of the stacks of L-shaped members is electrically connected to one of the terminals of a battery of a vehicle on which the coil is mounted and constitutes a common point to which one of the ends of the primary winding and one of the ends of the secondary winding are connected, the other end of the primary winding being connected through a switch to the terminal of the battery which is not connected to said common point.

4,099,511

REMOVABLE FUEL DOOR ON A WOOD BURNING STOVE

Kendrick H. McIntire, Rte. 2 Box 1000, and John E. McIntire, Rte. 2 Box 151-A, both of Aurora, Oreg. 97002

Continuation of Ser. No. 642,985, Dec. 22, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,299
Int. Cl.[2] F23M 7/00
U.S. Cl. 126—190 5 Claims



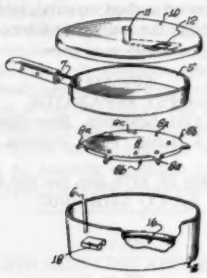
1. In a wood burning heating stove,
fire chamber means having a doorway surrounded by a jamb,
a door,
a hearth-like bracket secured to the fire chamber means in a position below the doorway and extending generally horizontally out from the doorway and having a pair of hinging slots,
a pair of hook-like hinge members fixed to the lower edge of the door and insertable into the removable from the slots to hinge the lower edge of the door to the bracket,
gasket means carried by the door,
and means for latching the door in a closed position in which the gasket means seals the door to the jamb,
the hook-like hinge members having end portions adapted to engage the fire chamber means when the door is in a substantially horizontal open position to hold the door in said open position.

4,099,512

HEAT-CONSERVING COOKING UTENSIL

Joseph Noonan, 100 Santa Inez, San Clemente, Calif. 92672

Filed Dec. 27, 1976, Ser. No. 754,356
Int. Cl.[2] A47G 23/04; F24C 15/18
U.S. Cl. 126—246 6 Claims



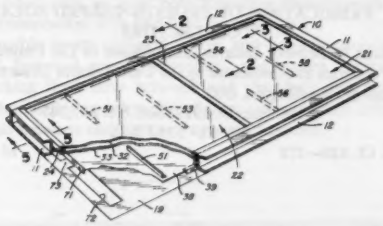
1. A cooking utensil adapted to be placed over a stove burner or the like, comprising:
a generally cylindrical pot-like housing having an open top, a substantial opening in the bottom having a bottom rim portion, and a generally vertically-extending slit in its side;
a cooking pan adapted to be placed inside said housing and having a generally radially-extending handle having an inner portion extendable through said slit to the outside;
a heat-distributing spider having a generally plate-like central portion smaller than said opening and a plurality of generally radially-extending legs having tip portions supportable in said bottom rim portion, and having spaces between said legs adapted to permit the passage of heated air from said burner up into the interior of said housing; and
a removable cover for said top,
said pan being removable from said housing by removing said cover and lifting upward on said handle externally of said housing, an inner portion of said handle passing through said slit.

4,099,513

SOLAR HEATING COLLECTOR

Robert K. Skrivseth, Whitewater, Wis., assignor to SolaRay, Inc., Whitewater, Wis.

Filed Mar. 3, 1977, Ser. No. 773,801
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 9 Claims



1. An air solar heating collector assembly, comprising
a rectangular framework having oppositely spaced end portions and oppositely spaced side portions,
a support plate fastened to and covering the back of said framework,
transparent cover means removably supported on and covering the front of said framework,
a solar energy absorber plate supported within said framework in parallel spaced relation between said support plate and said cover means, thereby defining a first air passage between said cover means and one surface of said absorber plate and a second parallel air passage between said support plate and the opposite surface of said absorber plate,
air inlet means adjacent one end portion of said framework for admitting cool air through said support plate to flow simultaneously across the opposite surfaces of said absorber plate through said first and second air passages,
air outlet means adjacent the opposite end portion of said framework for discharging heatred air simultaneously from said passages through said support plate, and
baffle means comprising a plurality of baffle members secured in spaced parallel relation to the opposite surfaces of said absorber plate in said first and second air passages, sand baffle members being arranged so that the air flow through each of said passages is alternatively split and recombined during its travel from said inlet means to said outlet means.

4,099,514

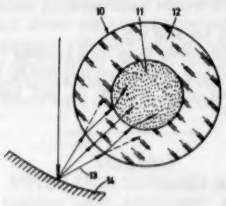
METHOD AND APPARATUS FOR HEATING A FLUID MEDIUM BY MEANS OF SOLAR ENERGY

Mario Posnansky, Pappelweg 4, 3072 Ostermundigen (Canton of Berne), Switzerland

Continuation-in-part of Ser. No. 537,677, Dec. 30, 1974, abandoned. This application May 7, 1976, Ser. No. 684,189
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 9 Claims

1. A method for collection of solar energy comprising:
a. focusing solar radiation on a transparent hollow receiver, said receiver containing an energy absorbent colored gas;

b. heating said fluid by said focused solar energy, to a temperature of at least 350° C;

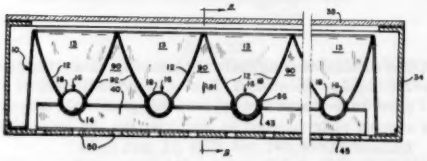


c. recirculating said colored gas to remove its collected energy and provide for solar energy reabsorption.

4,099,515
FABRICATION OF TROUGH-SHAPED SOLAR COLLECTORS

William W. Schertz, Batavia, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 29, 1977, Ser. No. 811,347
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 16 Claims



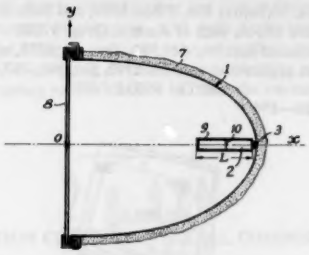
1. A cylindrical radiant energy concentration and collection device comprising: a plurality of rigid energy absorbers, a one-piece thin-walled plastic substrate having a plurality of pairs of opposing wall portions forming troughs, each wall portion being of predetermined contour and having thereon a material making said wall portion reflective for directing radiant energy incident thereupon, said substrate including a seating surface between each pair of opposing wall portions, each seating surface being adapted to receive one of said absorbers such that radiant energy is directed by said wall portions to said absorber, each of said seating surfaces being of such shape that said seating surface grasps said absorber and fits around said absorber received by said seating surface, said rigid absorbers thereby giving structural strength to said substrate.

4,099,516
SOLAR ENERGY PICK-UP

Daniel Pierre Caulier, Route d'Aix, 13122 Ventabren (Bouches-du-Rhône), France

Filed Apr. 28, 1976, Ser. No. 681,190
Claims priority, application France, Apr. 30, 1975, 75 14247
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 12 Claims

1. A solar energy pick-up producing an energy concentrating effect, comprising an elongated fixed mirror having a semi-elliptical transverse cross-section, said mirror having a light reflective surface on the concave side of its semi-elliptical cross-section, an open side, and a bottom portion opposite said open side adjacent the intersection of the major semi-axis of its semi-elliptical cross-section with the mirror, and a longitudinally extending heating collector positioned within the semi-elliptical cross-section of the mirror near said bottom portion thereof and along the major semi-axis of said mirror; said collector having a width L extending from adjacent the bottom portion of the mirror toward said open side thereof along said major semi-axis and said major semi-axis of the semi-elliptical mirror having a length *a*, said width L and length *a* being

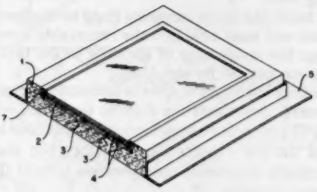


selected such that the width L is smaller than the length *a* and the ratio L/a is between $\frac{1}{4}$ and $\frac{1}{3}$.

4,099,517
SOLAR ENERGY COLLECTOR

Duncan Ross McRae, 1409 Wigmore Ct., Raleigh, N.C. 27609

Filed Jun. 21, 1977, Ser. No. 808,466
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 10 Claims

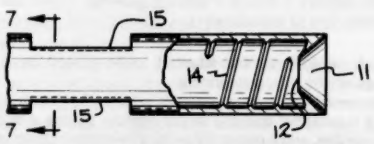


1. Solar energy collector apparatus, comprising:
an insulated, open-topped tray;
a moldable black coagulum of wetted carbon material being contained in said tray;
at least one sheet of light transmissive material covering said open top of said tray and said coagulum of carbon material therein; and
at least one heat transfer fluid conduit embedded in said coagulum of wetted carbon material, said tube entering and exiting through the walls of said tray.

4,099,518
BIOPSY APPARATUS

Shelby M. Baylis, 1761 Schoenith, Bloomfield Hills, Mich. 48013, and Jorge S. Szauer, 142 S. Johnson, Pontiac, Mich. 48053

Filed May 10, 1976, Ser. No. 684,480
Int. Cl.² A61B 10/00
U.S. Cl. 128—2 B 5 Claims



5. An apparatus for extracting biopsy samples and the like, comprising, in combination:
an elongated hollow outer cannula having open distal and proximal ends, said distal end defining a cutting edge;

solid inner means corresponding generally in length and shape to said outer cannula and being adapted to be tightly received within said hollow outer cannula for initial penetration of the body tissue;

a hollow inner cannula adapted to be received within said hollow outer cannula after said solid initial puncture means has been removed therefrom;

said inner cannula having an integral cylindrical elongated distal cutting end section which projects beyond the distal cutting edge of said outer cannula when said inner cannula is introduced thereinto in operative position;

said distal cutting end section of said inner cannula having disposed therein cutting means for cutting the body tissue as the inner cannula is withdrawn from the body and thus causing the tissue sample to be collected interiorly of the hollow inner cannula;

said cutting means disposed within said distal cutting end section of said inner cannula including a truncated conical cutting section having its base adjacent the distal edge of said inner cannula; and

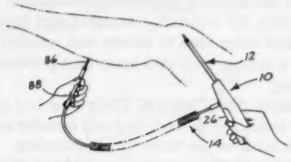
at least one sharp thread disposed on the inner periphery of said cutting end section to effect a tissue-cutting action when said inner cannula is rotated.

4,099,519

DIAGNOSTIC DEVICE

Fred E. Warren, 9205 SW. 91st Ave., #3J, Portland, Oreg. 97223

Filed Jan. 14, 1977, Ser. No. 759,353
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2.1 R **5 Claims**



1. A diagnostic and therapeutic tool comprising a portable body assembly adapted for hand manipulation, a first electrode probe assembly mounted on said body assembly terminating in an electrically conductive probe tip disposed outside the body assembly, a second electrode probe assembly mounted on said body assembly terminating in an electrically conductive probe tip disposed outside the body assembly, a piezoelectric element mounted in said body assembly and means electrically connecting the probe tips of the first and second electrode probe assemblies to opposite poles of said piezoelectric element, and trigger actuated means for mechanically stressing the piezoelectric element to generate a voltage in the piezoelectric element which appears directly across said tips.

4,099,520

BLOOD SAMPLING APPARATUS

Donald H. Decker, 1106 W. Bellbrook, Covina, Calif. 91722; William R. Davis, 6532 44th Northeast, Seattle, Wash. 98115, and Duane W. Falleti, 2231 Enterprise Dr., Richland, Wash. 99352

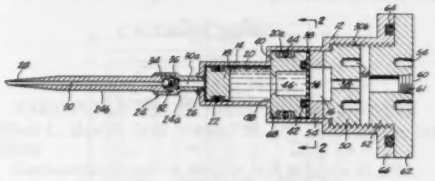
Filed Apr. 7, 1977, Ser. No. 785,509
Int. Cl.[2] A61B *5/14*
U.S. Cl. 128—2 F **13 Claims**

1. A pressure sensitive device for withdrawing fluids from or injecting fluids into mammals comprising:

a. a hollow body including first and second chambers, said first chamber having a fluid medium therein at a first pressure and said second chamber having a fluid medium therein at a second pressure whereby a predetermined pressure differential exists between said first and second chambers;

b. a piston carried within said first chamber for reciprocal movement therein;

c. an elongated probe connected at one end to said body and having at the opposite end a reduced diameter portion adapted to be inserted into the mammal, said probe being



provided with an axial bore extending therethrough in communication with said first chamber; and

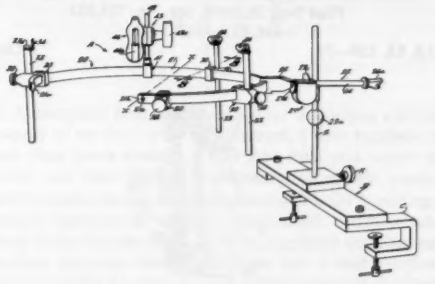
d. frangible means disposed within said body intermediate said first and second chambers, said means normally blocking fluid flow between said chambers, but being rupturable by a predetermined increase in pressure differential between said first and second chambers.

4,099,521

SURGICAL RETRACTOR ADJUSTABLE MOUNTING APPARATUS

Jack Nestor, and David H. Slepyan, both of Miami Beach, Fla., assignors to Nestor Engineering Associates, Inc., Miami, Fla.

Filed Jun. 16, 1975, Ser. No. 587,316
Int. Cl.[2] A61B *17/02*
U.S. Cl. 128—020 **11 Claims**



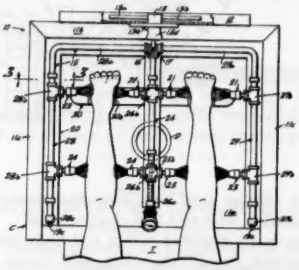
1. A surgical apparatus comprising a ring sized to substantially surround a work area at a spaced distance therefrom, a first means adjustably supporting the ring in a position adjacent the work area in concentric relation thereto, a plurality of connectors, each slidably mounted on the ring and having a post slidably mounted for axial movement therethrough in angular relation to the plane of said ring, a quick releasable anchoring means secured to each post, a plurality of retractors, one for engaging each part of the body to be withdrawn, a length of chain means connected to each retractor and adapted for engaging said anchoring means whereby the length of chain means between each retractor and its anchor means is selectively lengthened and shortened, each connector having a quick release means for simultaneously manually releasing and securing each connector in a selected position on the ring and its post in a selected position in the connector to adjust the position of said anchoring means and the direction of force exerted by the chain means on the retractor.

4,099,522

HYDROTHERAPY APPARATUS AND METHOD FOR EXERCISING THE VEINS OF THE LEG AND FOOT

Santiago S. Alenares, 3038 SW. 8th St., Apt. B202, Miami, Fla. 33135

Filed Apr. 25, 1977, Ser. No. 790,850
Int. Cl.[2] A61H 9/00
U.S. Cl. 128—66 11 Claims



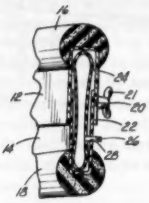
1. A method for exercising the smooth muscles of the veins of the legs and feet comprising the steps of reclining the patient in a supine position wth legs outstretched in horizontal alignment with the body and supported solely above the knees and at the heels, and directing sprays of water against opposite sides of each foot and calf according to a predetermined cycle of times and temperatures including a relatively low temperature for contracting the smooth muscles and a relatively high temperature for relaxing the smooth muscles.

4,099,523

THERAPEUTIC DEVICE

Thomas Patrick Lowrey, Kirkland, Ohio, assignor to Harry C. Walker and David E. Sukalac, part interest to each

Filed Sep. 20, 1976, Ser. No. 724,953
Int. Cl.[2] A61F 5/01
U.S. Cl. 128—75 6 Claims



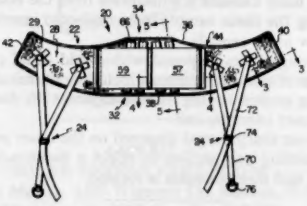
1. A therapeutic device for applying traction to a portion of the anatomy comprising,
- a pair of hollow substantially annular members, at least one of said members being hollow and U-shaped in cross section,
- said members being disposed in sliding telescoping relationship,
- said members having surfaces formed to at least partially encircle a selected portion of the anatomy,
- said members being formed of a relatively rigid, non-elastomeric material resistant to substantial deformation under pressure,
- fluid impervious bladder means disposed within the interior of the telescoped members,
- each of said members having internal bladder engaging surfaces,
- and means to allow fluid under pressure to be supplied to said bladder means,
- whereby fluid pressure in said bladder will generate a force against said bladder engaging surfaces urging sliding telescoping displacement without appreciable distortion of the members responsive to the fluid pressure in the bladder.

4,099,524

SACRO-LUMBAR SUPPORT BELT

Glenn F. Cueman, and Robert J. Becker, both of Warsaw, Ind., assignors to Zimmer, U.S.A. Inc., Warsaw, Ind.

Continuation of Ser. No. 629,475, Nov. 5, 1975, abandoned. This application Oct. 11, 1977, Ser. No. 840,700
Int. Cl.[2] A61F 5/02
U.S. Cl. 128—78 5 Claims



1. A sacro-lumbar support belt comprising:
- a waist encircling member,
- said member having top, bottom and two side edges, and inner and outer faces;
- said outer face of said member being formed entirely of brushed nylon pile;
- said inner face of said member being formed of urethane foam and having hook means located adjacent one end of said member, for releasably engaging said brushed nylon pile on said outer face to secure said member about the waist of a person with said inner face positioned against the person;
- non-stretchable fabric secured along said top and bottom edges by stitching for rendering said member substantially non-stretchable in the longitudinal direction;
- non-stretchable fabric secured along said two side edges and interconnecting said non-stretchable fabric on said top and bottom edges;
- a plurality of pockets secured to said outer face, said pockets extending transversely of said waist encircling member between said top and bottom edges;
- a plurality of stays receivable in said pockets;
- means for tightening said member once it is secured about the person's waist,
- said means including
  - two rectangularly-shaped elastic panels, each having a first end and a second end and being substantially as wide as said waist encircling member,
  - means for rigidly coupling said elastic panels at their first ends to said member outer face, and
  - hooks means, located at each of said second ends, for releasably engaging said brushed nylon pile on said outer face so said elastic panel second ends are securable to said outer face at any desired location therealong.

4,099,525

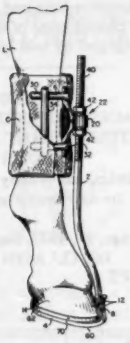
ANIMAL LEG BRACE

Robert O. McCarthy, 25 James Ave., Medfield, Mass. 02052

Filed Mar. 7, 1977, Ser. No. 775,329
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—87 R 8 Claims

1. An equine animal leg brace comprising a rigid elongated support member, a shoe attached to a first end of said member and adapted to be fixed to a bottom surface of a hoof of an animal, a rigid cast frame attached to said member and adapted to be fixed to a leg of said animal by a cast encompassing said

leg and said frame, said cast frame being movably disposed on said support member, and lock means for fixing said cast frame



on said support member, whereby to facilitate selective positioning of said cast frame on said support member.

4,099,526

FILTER-TYPE GAS MASK AND BREATHING DEVICE ARRANGED IN A CARRYING CASE

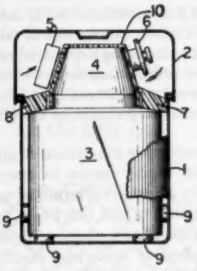
Werner Mascher, Bismarckstr. 6, 1000 Berlin 41, Fed. Rep. of Germany

Filed Nov. 30, 1976, Ser. No. 746,070

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554601

Int. Cl.[2] A62B 7/10

U.S. Cl. 128—146.6 14 Claims



1. A filter type gas mask arranged in a carrying case and a cover for said carrying case mounted thereon, said mask comprising;

a filter;

a filter head mounted on said filter;

said carrying case including a lower surface and sidewalls with an upper edge, said sidewalls extending perpendicularly upwards from said lower surface and terminating at said upper edge;

said cover including an upper surface and sidewalls with a lower edge, said sidewalls of said cover extending perpendicularly downwards from said upper surface and terminating at said lower edge,

means for connecting said upper edge of said carrying case to said lower edge of said cover wherein said carrying case and said cover form an enclosed chamber;

said filter and said filter head being located within said enclosed chamber such that said filter head is in proximity to said cover and said filter is in proximity to said carrying case; and

shock absorbing means connected to said filter head and extending outwardly therefrom in a direction towards said sidewalls of said cover and said sidewalls of said carrying case in the area where said sidewalls of said cover are connected to said sidewalls of said carrying case for holding said filter and said filter head firmly within said enclosed chamber formed by said carrying case and cover and for preventing contact between said filter and said filter head with any part of said carrying case and said cover by absorbing shocks and impact from all directions.

4,099,527

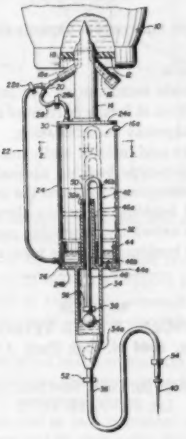
PARENTERAL FLUID ADMINISTRATION SETS

William L. Howell, 3615 Macomb St. NW., Washington, D.C. 20016

Continuation-in-part of Ser. No. 675,242, Apr. 8, 1976, abandoned. This application Mar. 16, 1977, Ser. No. 778,118

Int. Cl.[2] A61M 5/16

U.S. Cl. 128—214 C 10 Claims

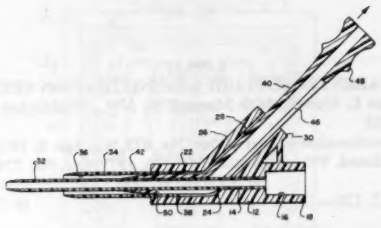


1. A parenteral fluid administration set comprising a source of supply of the fluid to be administered, a flow regulator to which fluid flows through a flow line from said source by gravity, said flow regulator comprising an upright plastic-walled cylinder having top-and-bottom-end walls providing a regulator chamber, a normally open-ended overflow tube affixed to the bottom end-wall of the regulator chamber and extending uprightly therein, the upper end of said overflow tube determining the maxium level of fluid permitted to collect in the regulator chamber, a floating siphon including an annular float and a siphon U-tube disposed in and being movable vertically within said regulator chamber in accordance with fluid level therein, means for supplying fluid from said source to the regulator chamber thereby to provide therein a body of fluid on which the float is adapted to float, said siphon U-tube being affixed to the float so as to be movable in unison therewith, the shorter leg of the siphon extending downwardly through the float and having its end open to the fluid body below the float, the longer leg of the siphon extending downwardly through the bore of said upright over-flow tube and having affixed thereto at a predetermined position along its length which normally is well above the open-top of the overflow tube a disc-form valve element which is adapted to lower against and seat on said open top of the overflow tube thereby to close said overflow tube to downward-outward air flow therethrough responsive to manually induced build-up of air pressure within said regulator chamber, said presure build-up also functioning to prime the siphon.

4,099,528
DOUBLE LUMEN CANNULA

James L. Sorenson; Karl A. Pannier, Jr., both of Salt Lake City, and Gordon S. Reynolds, Bountiful, all of Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah

Filed Feb. 17, 1977, Ser. No. 769,591
Int. Cl.[2] A61M *5/00, 25/00*
U.S. Cl. 128—214.4 8 Claims

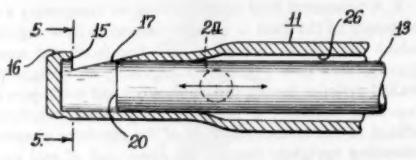


1. A double lumen intravenous cannula assembly comprising in combination:
an interior cannula;
an exterior cannula surmounting the interior cannula and being spaced from at least a portion of the interior cannula to form a passageway therebetween;
a hub mounted to said interior and exterior cannulae; and
a removable sleeve-type bushing normally coaxially interposed in the passageway between the interior and exterior cannulae, said bushing extending through said hub and comprising an exteriorly accessible member displaceable to remove the bushing from the passageway.

4,099,529
WIDE-ANGLE CUTTER VITROPHAGE

Gholam A. Peyman, 1044 N. Oak Park Ave., Oak Park, Ill. 60302

Filed Sep. 20, 1976, Ser. No. 724,709
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—305 1 Claim

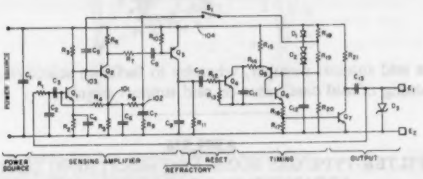


1. A surgical instrument for performing intraocular surgery involving the removal of fibrous tissue from within the eye of a patient and having a control handle carrying a small diameter probe for insertion into the eye comprising:
an external tube as part of the probe having an external wall and a longitudinal axis and formed with a closed end tip and a generally triangular shaped aperture in its external wall;
said triangular aperture being oriented with a base edge tranverse to said longitudinal axis in close proximity to and adjacent said tip and defining a tissue engaging ledge and with an apex of said aperture being remote from said tip said base edge lying in a plane perpendicular to said longitudinal axis;
an internal cutting tube coaxial with and telescoped within said external tube having a driven end and a free end with a sharp cutting edge formed on said free end;
drive means connected to said driven end for causing controlled longitudinal oscillation of said internal tube within said external tube and operable in its oscillation to carry said cutting edge past said base edge of said aperture; and
means defining a sharp shearing edge formed on an inner edge of said aperture base and effective in shearing coaction with said cutting edge of said internal tube to cleanly sever tissue engaged by said ledge.

4,099,530
CARDIAC PACER CIRCUITRY TO FACILITATE TESTING OF PATIENT HEART ACTIVITY AND PACER PULSES

Chieh Y. Chen, Billerica, and Wesley R. Grace, Andover, both of Mass., assignors to American Pacemaker Corporation, Woburn, Mass.

Filed Apr. 27, 1977, Ser. No. 791,552
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PT 13 Claims



1. An improved implantable electronic heart pacer having a self-contained power source, said pacer including terminal means for connection to the heart of a patient, pulse generator means connected to said terminal means for supplying stimulating pulses thereto, timing means for controlling the rate of delivery of said stimulating pulses, and heart beat detecting means for preventing delivery of said stimulating pulses when the patient has normal heart activity, said timing means having a test mode rate and a demand mode rate which is different from said test mode rate, at least one of said test mode rate and said demand mode rate being dependent upon remaining useful life of said power source, said improvement comprising:
means responsive to an externally applied magnetic field, for inducing said timing means to operate at said test mode rate;
delay means responsive to removal of said magnetic field for inducing said timing means to operate at said demand mode rate for a first predetermined period of time;
means for inactivating said heart beat detecting means only after application of said magnetic field for a second predetermined period of time, said inactivating means being operative during application of said magnetic field and during said first predetermined period of said delay means;
means responsive to an externally applied magnetic pulse having a duration which is short compared with the normal demand mode pulse-to-pulse interval to inhibit said pulse generator means when said pulse generator means is pacing in said demand mode.

4,099,531
FLAVORING INGREDIENT

Edouard P. Demole, Coppet, and Paul F. Enggist, Geneva, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Mar. 25, 1976, Ser. No. 670,245
Claims priority, application Switzerland, Apr. 11, 1975, 4630/75
Int. Cl.[2] A24B *3/12*
U.S. Cl. 131—17 R 2 Claims

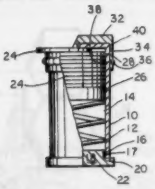
1. A smoking tobacco product selected from the group consisting essentially of tobacco and tobacco substitutes which has added thereto a small but flavour-modifying amount of a flavouring compound consisting essentially of 2-phenyl-3-(fur-2-yl)-prop-2-en-1-al.

4,099,532

COIN HOLDER HAVING RIB RETAINED CLOSURE

Enio Mascherin, 90 Glenhaven St., Toronto, Ontario, Canada (M6M 3M5)

Filed Jan. 28, 1977, Ser. No. 763,407
Int. Cl.[2] G07D 1/08
U.S. Cl. 133—5 A 6 Claims



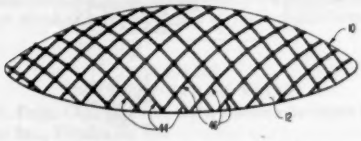
1. A hollow container comprising a tubular walled body having an inner and outer surface and at least one open end, said body having a predetermined internal diameter, a cap portion removably engaging one end of said body, means for engaging said cap portion, a coiled spring disposed in said body, an annular rib disposed on the outer surface of said body, a partial wall covering at least a portion of the opposite end of said body, a cover member having a top portion and annular neck engaging said opposite end of said body, said neck including an annular recess communicating with said rib, said cover rotatable around said rib, said top portion being smaller than the diameter of said cover portion whereby when said top portion is axially aligned with said partial wall said body is at least partially opened and when said cover portion is rotated such that said top portion is not axially aligned with said partial wall said body is substantially closed.

4,099,533

CONCAVE-CONVEX STRUCTURE WITH SPACED FITTINGS FOR INTERSECTING FLEXIBLE RODS

Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95003

Continuation-in-part of Ser. No. 614,445, Sep. 18, 1975, Pat. No. 3,986,519. This application Sep. 30, 1976, Ser. No. 728,182
The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.
Int. Cl.[2] A45F 1/16
U.S. Cl. 135—3 E 13 Claims



12. A dome structure comprising
a plurality of continuous stressed rods, each rod being of arcuate shape, said rods crossing each other at a plurality of intersections,
a flexible membrane beneath said rods,
means at substantially all of said intersections attached to said membrane holding said rods in intersecting relationship and for allowing slideable movement of said rods relative to each other and said membrane, and
second means supporting said membrane at fixed points on said membrane from each of said first means.

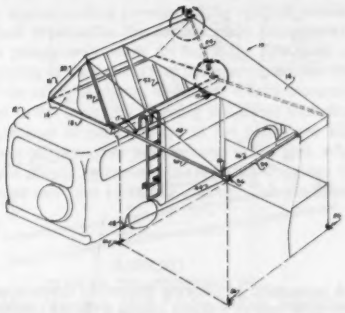
4,099,534

VAN TOP TENT

John R. Corbin, 404 Garwood Dr., Cherry Hill, N.J. 08034

Filed Feb. 16, 1977, Ser. No. 769,391
Int. Cl.[2] A45F 1/16; B60P 3/34
U.S. Cl. 135—4 A 7 Claims

1. A van top tent comprising:
a substantially hollow container having a top and a base, means pivotally connecting said top and said base together so that said top can be pivoted relative to said base between a closed and an opened position;
a pair of poles each of which has a first end pivotally connected to said top and a second normally free end, said poles being pivotally movable between a first position within said container to a second position wherein said second ends cooperate with said base to maintain said top in said opened position;
first and second support poles, each of said support poles having a first end pivotally connected to said base and a second end, said support poles being adapted to be pivoted in a substantially horizontal plane between a first position within said container to a second position wherein said



support poles extend away from and substantially perpendicular to said container;
a connecting pole having a first end pivotally connected to the second end of said first support pole and connecting means adapted to releasably connect the second end of said connecting pole and the second end of said second support pole;
cable means connected between said top and said supporting poles for maintaining said support and connecting poles in a substantially horizontal plane;
tent fabric connected to said container and adapted to substantially cover and be suspended from said poles, and
all of said poles, cable means and tent fabric being adapted to fit within said container when said container is closed.

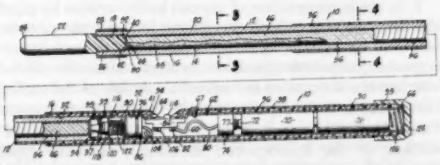
4,099,535

LIGHT EMITTING WALKING CANE

Louis H. Hubachek, 870 S. Gramercy Pl., No. 2, Los Angeles, Calif. 90005

Filed Feb. 22, 1977, Ser. No. 770,572
Int. Cl.[2] A45B 3/04
U.S. Cl. 135—66 16 Claims

1. A walking cane comprising:
an elongate staff of generally tubular construction having a ground engaging tip portion at one end and a handle portion at the other end;



means on the outer surface of said staff providing surrounding light transmitting areas in end-to-end relation on said staff of different colors respectively adjacent said tip portion and said handle portion;
light generating means in the handle portion including a switch controlled electric lamp;

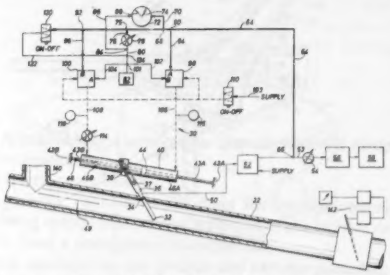
light conducting elongate cylindrical means within said staff extending along said light transmitting areas and having one end positioned to axially receive light from said lamp, and an opposite end portion adjacent said tip portion; and said opposite end portion of said cylindrical means having a roughened surface for producing diffused light in the light transmitting area adjacent said tip portion.

4,099,536

METHOD AND APPARATUS FOR CONTROLLING A SURGING FLOW IN A CLOSED CONDUIT

Ethell J. Dower, Houston, Tex., assignor to Warren Automatic Tool Co., Houston, Tex.

Filed Jul. 21, 1976, Ser. No. 707,230
Int. Cl.[2] G05D *7/00, 16/00*
U.S. Cl. 137—2 **19 Claims**



1. A pneumatic monitoring device for continuously observing the flow rate of a liquid within a closed conduit comprising:

a flapper disposed within said conduit, said flapper being responsive to flow rate of a liquid therethrough;

a pneumatic signal generator in communication with said flapper, said pneumatic generator adapted for producing a first pneumatic signal functionally related to the instantaneous flow rate of a liquid through said conduit;

a damping assembly in communication with said first pneumatic signal and producing a second pneumatic signal functionally related to said first pneumatic signal and representative of a damped liquid flow rate through said conduit;

a relay assembly in communication with said damping assembly and adapted for receiving said first and second pneumatic signals and producing a pneumatic control signal in response thereto; and,

a pneumatic positioner adapted for receiving said pneumatic control signal and for positioning said flapper in response thereto.

4,099,537

METHOD FOR TRANSPORTATION OF VISCOUS HYDROCARBONS BY PIPELINE

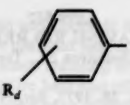
George Kalfoglou, Houston, and Kenoth H. Flournoy, Levelland, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,711
Int. Cl.[2] F17D *1/17;* **B01F** *17/00*
U.S. Cl. 137—13 **2 Claims**

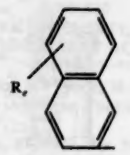
1. In the transportation of viscous hydrocarbons by pipeline, the improvement which comprises forming an oil-in-water emulsion by inroducing into the pipeline with said hydrocarbons an aqueous solution of an oxyalkylated anionic surfactant wherein the amount of the aqueous solution of the surfactant introduced into the pipeline with the said hydrocarbon ranges from about 8 to about 60 percent by volume based on the volume of the hydrocarbon introduced into the pipeline, wherein the concentration of the said surfactant in the aqueous solution is from about 0.01 to about 2.5 weight percent and wherein the oxyalkylated surfactant is a compound of the formula:

$$R_c O(C_2H_4O)_r—(C_3H_6O)_s—(C_2H_4O)_tCH_2CH_2SO_3M,$$

wherein R_c is selected from the group consisting of alkyl of from 10 to 25 carbon atoms;



wherein R_d is alkyl of from 8 to 25 carbon atoms, and



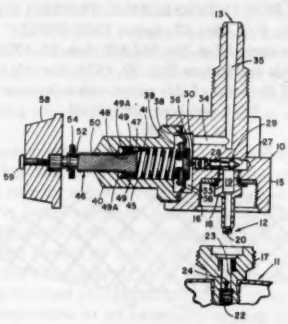
wherein R_e is alkyl of from 8 to 25 carbon atoms; r is an integer of from 2 to about 10; s is an integer of from 1 to about 8; t is an integer of from 2 to about 10, and the sum of $r + s + t$ is not more than 20, wherein at least 60 percent of the oxyalkylene units are oxyethylene units and wherein M is selected from the group consisting of sodium, potassium, lithium and the ammonium ion.

4,099,538

TEMPERATURE-RESPONSIVE SHUT-OFF FOR GAS FUEL REGULATOR VALVE

Richard Douglas Curtis, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Mar. 3, 1977, Ser. No. 773,858
Int. Cl.[2] F16K *17/38*
U.S. Cl. 137—73 **3 Claims**



1. In a regulator valve for an applicance using gaseous fuel and having housing means defining inlet and outlet ports, an actuatable valve in said housing means between said ports, a flexible diaphragm assembly adapted to actuate said valve and a spring having one end engaging said diaphragm assembly for urging said diaphragm assembly into operative relation with said valve, an improved shut-off comprising: an adjusting valve stem threadedly received in said housing for longitudinal adjustment; a sleeve mounted about said stem within said housing and displaceable relative to said stem, said sleeve including flange means engaging the other end of said spring for adjusting the compression of said spring as said stem is adjusted; and fusible material meltable at a predetermined temperature securing said sleeve to said stem within said housing; whereby if said temperature is reached, said fusible material will melt and said spring will displace said sleeve relative to said stem thereby permitting closing a said valve.

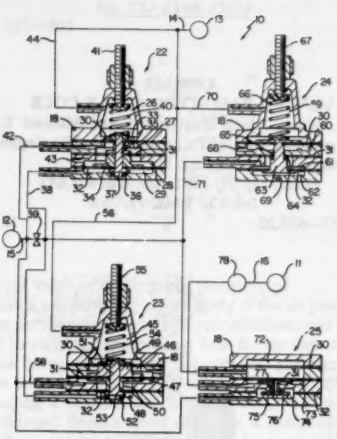
3. The apparatus of claim 1 wherein said fusible material is an alloy which melts at a temperature of approximately 227° F.

4,099,539

CONTROL SYSTEM AND CONTROL DEVICE THEREFOR

Harold G. Brakebill, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 25, 1977, Ser. No. 800,211
Int. Cl.[2] G05D *16/00*
U.S. Cl. 137—84 20 Claims



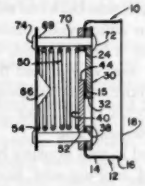
1. A control system comprising a first source having a changeable fluid pressure value, a second source having a changeable vacuum value, a pressure operated control device that changes its operating condition in relation to the value of a pressure signal directed thereto, and pneumatically operated control means operatively interconnected to said sources and said control device for increasing said pressure signal from said first source to said device as the pressure value from said first source increases from a first value thereof to a second value thereof and for thereafter decreasing said pressure signal from said first source to said device as the pressure value from said first source further increases from said second value thereof to a third value thereof, said control means producing said signal in substantially the same manner but at different values for different levels of vacuum at said second source thereof.

4,099,540

TWO-WAY BYPASS VALVE

Louis S. Papp, Chagrin Falls, Ohio, assignor to Incom International Inc., Pittsburgh, Pa.

Filed Sep. 7, 1976, Ser. No. 721,326
Int. Cl.[2] F16K *17/18*
U.S. Cl. 137—493.8 12 Claims



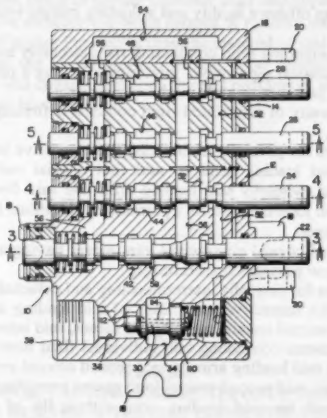
1. Two-way valve apparatus having a base, a seat connected to the base, the seat having first and second faces and first and second passageway means within the seat for communicating openings in the first face with openings in the second face, first and second valve plates mounted respectively on the first and second faces of the seat, the first valve plate having first plate passageway means communicating with the first seat passageway means for flowing fluid through the first plate passageway means and through the first seat passageway means, the second valve plate having second plate passageway means communicating with the second seat passageway means for flowing fluid through the second plate passageway means and second seat passageway means and resilient means urging the first and second valve plates into contact with the first and second faces whereby a portion of the first plate overlies the second seat passageway in sealing relationship therewith and whereby a portion of the second plate overlies opening of the first seat passageway in sealing relationship therewith, whereby fluid pressure in the first plate passageway and the first seat passageway tends to move the second plate away from the first seat passageway against sealing pressure of the resilient means, and whereby fluid pressure in the second plate passageway and second seat passageway tends to move the first plate away from the opening of the second seat passageway against sealing pressure of the resilient means, alignment means connected to the base and to the plates for aligning the plates with the seat whereby openings of passageways in the plates are aligned with openings of respective passageways in the seat, wherein the alignment means comprise pin-receiving openings in the plates and seat and pins extending through the pin-receiving openings.

4,099,541

POWER TRANSMISSION

Carl R. Binkley, Marshall, Mich.; John B. Keir, Marietta, Ga., and John H. Semchena, Royal Oak, Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Nov. 12, 1976, Ser. No. 741,202
Int. Cl.[2] F15B *13/08, 13/04*
U.S. Cl. 137—596.13 5 Claims



1. In a multiple unit directional valve assembly having a body, an inlet port in said body, an outlet port in said body and a plurality of motor ports in said body, said valve having a plurality of valve bores each communicating with one of said motor ports, a plurality of inlet passages in said body, each inlet passage communicating with one of said valve bores, said inlet passages being in parallel connection to the valve inlet port, said valve having a valve spool in each valve bore shiftable to effect communication between one of said inlet passage and one of said motor ports and having a balanced relief valve in the body to divert flow from the inlet port to the outlet port directly, said relief valve having a control chamber fed from the valve inlet through a restriction, that improvement comprising:

separate restrictors in at least two of said inlet passages;

separate passage means extending from said control chamber to points downstream from said separate restrictors; and

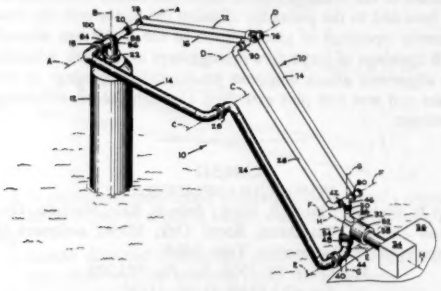
a check valve in each of said separate passage means, said check valves being so oriented as to permit flow out of said control chamber, whereby whenever two or more spools are in the motor-supply position, the relief valve will be controlled to maintain a supply pressure only sufficient to overcome the smallest load pressure in any of the motor ports which are at the time connected to the inlet port.

4,099,542

MARINE LOADING ARM JUMPER ASSEMBLY

Harold M. Gibbons, Long Beach, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jun. 9, 1976, Ser. No. 694,256
Int. Cl.[2] B67D 5/00
U.S. Cl. 137—615 **5 Claims**



1. A marine loading arm assembly for simultaneously transferring a plurality of fluid products in separate flow passages between an offshore facility and a floating marine vessel, comprising

a. an upstanding fluid conducting riser assembly including a first coaxial pipe swivel joint means having a plurality of flow passages therethrough,

b. a pluraity of articulated rigid conduits defirming loading arms,

c. means for pivotally connecting the respective inner ends of said loading arms to said first coaxial swivel joint means, whereby said loading arms and said first coaxial swivel joint means form a plurality of individual fluid flow passages,

d. second coaxial pipe swivel joint means having a plurality of flow passages therethrough,

e. means for pivotally interconnecting and detachably securing the respective outer ends of said loading arms with said second coaxial swivel joint means, said interconnecting means continuing said individual fluid flow passages from said loading arms to said second coaxial swivel joint means, said second swivel joint means providing primary support for said loading arms outwardly of said first swivel joint, and

f. means for maintaining said loading arms and said second coaxial swivel joint means in a predetermined alignment relationship when said loading arms are disconnected from said second coaxial swivel joint means, said maintaining means comprising a guide arm assembly having a plurality of non fluid-conducting arm sections, means pivotally interconnecting said arm sections, and means pivotally connecting said assembly to said first and second coaxial swivel joint means, said pivotally interconnected guide arm sections being free of attachment to either of said loading arms between said first and second swivel joint means,

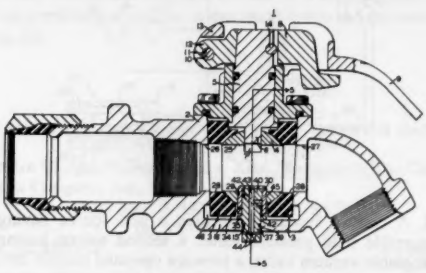
whereby said loading arms and said second coaxial swivel joint means can be maneuvered without interference and as an assembly between at least two positions to provide a plurality of individual flow conduits for separate and simultaneous transfer of individual fluid products and wherein connection misalignment of said loading arms in a lateral plane as a result of relative movement between said joints in any direction when the loading arms are disconnected therefrom is prevented by said guide arm assembly supported between said joints.

4,099,543

VENTED BALL TYPE ANGLE COCK

William K. Mong, North Huntingdon, and Michael T. Zoric, North Versailles, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 31, 1977, Ser. No. 801,683
Int. Cl.[2] F16K 11/06
U.S. Cl. 137—625.22 **10 Claims**



1. A ball-type angle cock comprising:

a. a hollow housing having a pair of passageways opening thereinto to which may be connected respectively an inlet conduit and an outlet conduit,

b. a pair of ball seat seals disposed in said hollow housing in opposite spaced-apart relationship and each having a through bore that at one end is in alignment with one end of one of said pair of passageways in said housing, the opposite end being provided with a spherical seat, wherein the improvement comprises:

c. a ball valve element having a passageway therethrogh and so positioned between said ball seat seals in sealing relationship with said spherical seat on each respective ball seat seal as to, in an open position of said element, establish a communication between said inlet conduit and said outlet conduit, said ball valve element also having a pair of intersecting bores therein, one of said bores so intersecting said passageway that the axis thereof forms a right angle with the axis of said passageway,

d. a valve stem rotatably mounted in said housing and separably connected to said ball valve element for effecting rotation of said element between said open position and a closed position in which said communication is closed,

e. a bushing having a bore therein, said bushing being so disposed in said one bore in said ball valve element that one end of said bore in said bushing is in alignment with one end of the other of said pair of intersecting bores in said ball valve element, and

f. a trunnion carried in said housing bore rotatably supporting thereon said bushing and having a passageway so extending therethrough that one end thereof is constantly open to atmosphere and the other end is in alignment with the other end of said bore in said bushing in only said closed position of said ball valve element whereby a venting communication is established between said outlet conduit and atmosphere.

4,099,544
VENT VALVE OF AN AIR PUMP

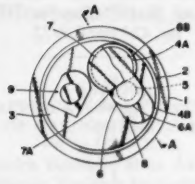
Tsuyoshi Itakura, Itakura Soki Kabushiki Kaisha, 17-20, Unoki 3-Chome, Ohta-ku, Tokyo, Japan, and Allan H. Willinger, Willinger Bros., Inc., 351 E. 84th St., Apt. 22A, New York, N.Y. 10028

Filed Feb. 4, 1977, Ser. No. 765,792

Claims priority, application Japan, Oct. 26, 1976, 51-143046[U]

Int. Cl.² F16K *15/14*

U.S. Cl. 137—856 **3 Claims**



1. A vent valve of an air pump comprising:

a separator wall dividing a main body of the air pump into an inner air chamber and an outer air chamber, said separator wall having an insertion vent hole for air flow communication between said inner and outer air chambers;

a valve body consisting of silicone rubber, said valve body including a disc-shaped tongue section and an annular disc-shaped fixed section to define a guitar-like shaped member, said tongue section having a semi-circular portion connected to a base portion, said base portion of said tongue section being connected to said fixed section to provide a one-piece valve body member, said tongue section having a diameter larger than said insertion vent hole for closing said insertion vent hole, said fixed section having a diameter larger than said tongue section diameter;

said tongue and fixed sections being disposed in contact against a surface of said separator wall with said tongue section closing said insertion vent hole;

a support member consisting of a rubber material, said support member being retained by a retaining section of said separator wall in an abutting position against said fixed section of said valve body so that said fixed section is sandwiched between said separator wall and said support member; and

an edge of said support member extending to said tongue section to a position across said insertion vent hole so that an edge portion of said support member closes a portion of said insertion vent hole.

4,099,545
LARGE PORT PRESSURE ACCUMULATOR

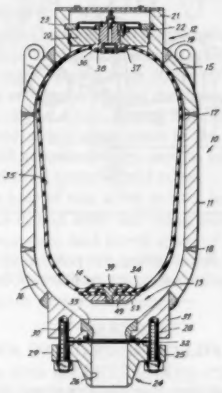
Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed May 19, 1976, Ser. No. 688,102

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **2 Claims**

1. A large port pressure accumulator-pulsation dampener device especially adapted for use in the pumping of liquids having entrained abrasive solids, comprising a rigid casing, a gas port at one end of said casing, a fluid port at the other end of said casing, said fluid port being surrounded by a beveled valve seat which is circular in section, a bladder assembly disposed within said casing and dividing the same into a gas and a liquid chamber, said bladder assembly including a stretchable elastomeric bladder having a relatively small opening at one end and a closed end, a gas inlet fitting molded in the small opening in said bladder and extending through said gas port, retainer means for securing said fitting in fixed position in said gas port, a valve assembly carried by the closed end of said bladder and shiftable between sealing and unsealing positions of said liquid port, said valve assembly including a plug member, said plug member having a flanged inner end molded entirely within said closed end of said bladder without communication with the interior of the bladder, a span of bladder material completely overlying the inner end of said plug, said plug member having a shank portion extending axially outward therefrom and from the closed end of the bladder, a rigid valve member releasably mounted on said axially extending shank portion in opposed relation to said valve seat, said valve member being circular in transverse section and complementally beveled with respect to said seat, said valve member including an upper surface portion directed toward said bladder, and a circular sealing disc clamped between said closed end of said bladder and said upper surface of said valve member, said disc being of greater diameter than said upper surface of said valve member and being formed of resilient elastomeric material of higher durometer than the material of said bladder, said disc in the seated position of said valve assembly being deformed into engagement with beveled portions of said valve seat by said bladder.



4,099,546
DEVICE FOR VARYING THE BEATING-UP POSITION OF THE REED OF A TEXTILE LOOM FOR TURKISH TOWELLING

Nicola Santucci, Schio (Vicenza), Italy, assignor to Nuovo Pignone S.p.A., Italy

Filed Nov. 22, 1976, Ser. No. 744,107

Claims priority, application Italy, Dec. 11, 1975, 30194 A/75

Int. Cl.² D03D *39/22*

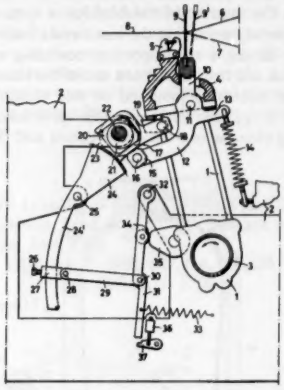
U.S. Cl. 139—27 **4 Claims**

1. A device for varying the beating-up position of the reed in textile looms used for the manufacture of Turkish towelling, in which the reed is mounted hingedly on the loom sley, comprising:

a set of feeler members mounted integrally with the hinged reed,

a set of forked profiles which are hinged to the fixed loom frame,

resilient means urging the feeler members into continuous contact with the forked profiles, and,



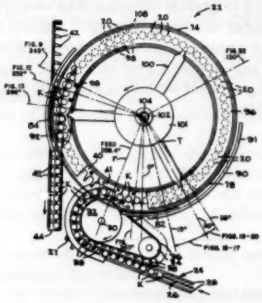
control means for adjusting the position of the forked profiles to vary the beating-up position of the reed.

4,099,547

CONTAINER FILLING EMPLOYING ANTI-VACUUM FOOT VALVE

Sherman H. Creed, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 26, 1977, Ser. No. 762,705
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—5 **27 Claims**



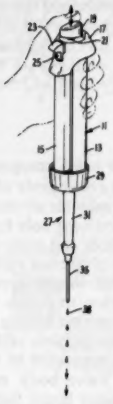
26. The method of filling open top containers with a liquid containing dissolved gas under pressure, said method being of the type which comprises the steps of trapping a measured charge of the liquid under pressure in a measuring chamber defined by a cylinder having a filling port that is closed by a foot valve and a piston slidable in the cylinder and having a charging port that is closed by a plug valve, moving the foot valve toward its open position during a decompression stage while the valve still closes the filling port to enlarge the measuring chamber sufficiently to decompress the gas in the measured charge of trapped liquid down to atmospheric pressure and thereafter opening the foot valve for discharging liquid from the measuring chamber into a container; the improvement comprising the step of moving a pressure equalizing element into the measuring chamber sufficiently to maintain the volume of the measuring chamber substantially constant while the piston is stationary and as the foot valve is moved still further toward its open position after termination of the decompression stage but while the foot valve still closes the filling port and before the discharge of the measured charge of liquid from the measuring chamber begins, for preventing reduction of the pressure in the measuring chamber to subambient pressure during said further opening motion of the foot valve.

4,099,548

HAND-HELD PIPETTE FOR REPETITIVELY DISPENSING PRECISE VOLUMES OF LIQUID

Ronald Leo Sturm, San Carlos, and James Curtis Smith, Hayward, both of Calif., assignors to Oxford Laboratories Inc., Foster City, Calif.

Filed Aug. 25, 1976, Ser. No. 717,744
Int. Cl.[2] B65B *3/12*
U.S. Cl. 141—27 **17 Claims**



1. A pipette having an interrelated mechanism for drawing liquid thereinto, repetitively dispensing a plurality of small quantities of liquid therefrom between fillings, and disengaging part thereof, comprising:

an elongated housing having first and second ends,

an elongated slide held for reciprocation along a path within said housing in a direction of its length,

a fluid chamber positioned at said first housing end and having an opening for dispensing and drawing fluid therethrough in response to the fluid volume of said chamber being altered,

means for altering the fluid volume of said chamber,

means within said housing for operably connecting said volume altering means to said elongated slide,

means within said housing and responsive to a first external knob at the second housing end for incrementally advancing said slide from a beginning adjacent said second housing end in a direction toward said first housing end to a maximum first knob advanced position within said housing, said slide being advanced a small fraction of its total travel each time said external knob is depressed, thereby to incrementally reduce the volume of said fluid chamber each time said first knob is depressed and thus to displace a desired volume of fluid through said chamber opening,

means within said housing non-integral with said slide and responsive to a movement of a second external knob in one direction with respect to said housing for returning said slide to its said beginning position adjacent said second housing end, thereby to increase the fluid volume of said chamber when said second knob is moved in said one direction and thus to draw fluid thereinto through said chamber opening,

means within said housing non-integral with said slide and responsive to movement of the second knob in another direction with respect to the housing for moving said slide beyond its said maximum first knob advanced position in a direction toward said first housing end, thereby to reduce

the fluid volume of said fluid chamber to a minimum not possible with said first knob,

connecting means at said first housing end for disengaging said fluid chamber therefrom, and

means as part of said connecting means between the slide and volume altering means that is responsive to the simultaneous disengagement of said chamber by said connecting means and to further movement of said second knob in said another direction beyond its minimum fluid chamber volume position for disengaging said fluid volume altering means from operable connection with said slide, whereby said fluid chamber and volume altering means can be removed from the pipette housing for cleaning or replacement.

4,099,549

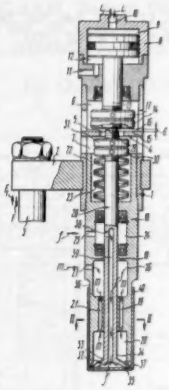
DEVICE FOR APPLICATION OF PASTE TO INTERNAL SURFACE OF CYLINDRICAL ELECTRODE OF PRIMARY CELL

Leonid Lavrentievich Belyshev, ulitsa Akademika Komarova, 19a, kv. 52, Moscow; Veniamin Ivanovich Gorokhov, poselok Pravdinsky, 2 Novoproletarskaya ulitsa, 1, kv. 4, Moskovskaya oblast, and Albert Vladimirovich Chuvpilo, ulitsa Novo-Alexeevskaya, 48, korpus 37, kv. 281, Moscow, all of U.S.S.R.

Filed Jun. 23, 1977, Ser. No. 808,978

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—32 **1 Claim**



1. A device for application of paste to an internal surface of a cylindrical electrode of a primary cell comprising:

a cylindrical body with means for reciprocating motion;

a partition dividing said body into upper and lower parts and being provided with a hole;

a hydraulic cylinder installed in said upper part of said body and having a rod;

a limiting nut installed at the end of said rod and having a diameter which is larger than the diameter of said hole in said partition;

a cylindrical arbor having an external surface secured by an upper part in said lower part of said body and having a central channel accommodating consecutively arranged first, second, third and fourth spaces,

said first space of said arbor being located in said lower part of said arbor for holding a supply of paste,

said second apace of said arbor being located in the upper part of said arbor,

said third space of said arbor being located in the middle part of said arbor,

said fourth space of said arbor being located in the middle part of said arbor between said third and said first speaces of said arbor;

a mandrel installed in said central channel of said arbor with means for reciprocating motion and having an upper cylindrical part and a lower part in the form of a truncated cone whose larger base serves as the face of said mandrel,

said mandrel including a channel for compressed air,

a side hole in said mandrel located in the zone of said third space of said arbor and placing said channel of said mandrel in communication with said third space of said arbor;

an adjusting nut installed at the end of said upper part of said mandrel below said partition and having a diameter which is smaller than the diameter of said second space of said arbor;

a spring installed on said mandrel and located in said second space of said arbor;

said lower part of said mandrel being made in the form of a truncated cone having its generatrix inclined to said larger base at an angle varying from 10° to 60°, the ratio of the diameter of said larger base to the diameter of said external surface of said arbor ranging from 0.77 to 0.98;

a first side hold of said arbor made in the zone of the third space of said arbor and being used to supply compressed air into said third space of said arbor;

a second side hole of said arbor located in the zone of said fourth space of said arbor and being used to supply paste under pressure into said fourth space of said arbor; and

at least one channel for paste made inside of said arbor for placing said first and said fourth spaces of said arbor in communication with each other.

4,099,550

APPARATUS FOR FILLING LIQUID CRYSTAL INTO THE CELLS OF LIQUID CRYSTAL DISPLAY DEVICES

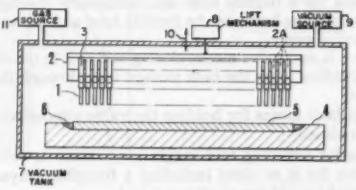
Hideo Matsuzaki, and Keiji Yajima, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 10, 1976, Ser. No. 722,011

Claims priority, application Japan, Nov. 12, 1975, 50-135055

Int. Cl.[2] B65B *31/02*

U.S. Cl. 141—51 **6 Claims**



1. Apparatus for filling a liquid crystal into a cell of a liquid crystal display device, said cell being provided with a liquid crystal filling port, said apparatus comprising a cell holder for supporting a plurality of cells in spaced parallel relationship, a support provided with at least one longitudinal groove in the surface thereof for accommodating said liquid crystal, liquid crystal holding means contained in said groove and including capillary passages for the liquid crystal which, due to the surface tension of said liquid crystal, are operatively and locally communicated with the liquid crystal filling port of respective cells by a thin film of liquid crystal about said filling port thus creating a minimized contact area between the liquid crystal and the cell, a vacuum tank containing said holder mounted with the cells and said support with said liquid crystal holding means, means for producing a vacuum in said tank, means for introducing inert gas into the vacuum tank, and means for contacting the filling port of the respective cells against said liquid crystal holding means, said contacting means supporting said cell holder in said vacuum tank in spaced relationship to the surface of the liquid crystal holding means when said vacuum tank is being evacuated and said cell filling port brought into contact with said liquid crystal hold-

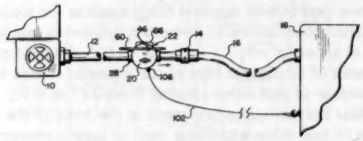
ing means when the inert gas is being introduced, thereby filling said liquid crystal into the cells through said filling ports.

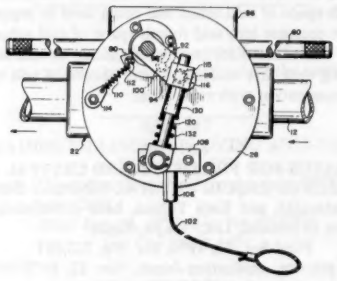
4,099,551

THERMAL-MANUAL CONTROL VALVE

Evans R. Billington, Glenview, and William Nicholas, Chicago, both of Ill., assignors to Golconda Corporation, Chicago, Ill.

Filed Jul. 23, 1976, Ser. No. 708,128
Int. Cl.[2] F16K *17/38, 31/46, 31/56*
U.S. Cl. 141—388 **10 Claims**





8. A bulk storage tank for LP Gas having a manually controlled liquid eduction valve means connected to a transport truck tank by a flexible hose and a manually disengageable conduit coupling between the flexible hose and the valve seat of the valve means;

a valve in said valve means closing said seat in the direction of outflow from the bulk storage tank through the valve seat;

toggle joint means for holding the valve alternatively open and closed;

means for actuating said toggle joint means to release the valve for it to close including a frangible lanyard connected to said transport truck tank.

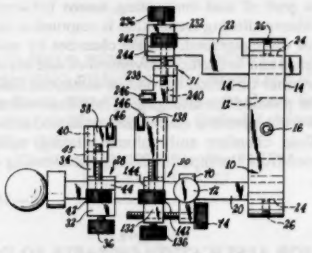
4,099,552

ATTACHMENT FOR A POWER TOOL

Reginald Gordon Dyball, 34 Fitzroy St., St. Kilda, Victoria, Australia (3182)

Filed Oct. 19, 1976, Ser. No. 733,888
Claims priority, application Australia, Oct. 24, 1975, 3711/75
Int. Cl.[2] B27C *5/10*
U.S. Cl. 144—134 D **10 Claims**

1. An attachment for a power tool adapted to perform materials working operations along an edge defined by mutually inclined adjacent surfaces on a workpiece by means of a rotatable shaping element thereof; said attachment having a base member and first and second arms mounted on said base member and projecting therefrom in mutually spaced relationship; a respective guide member mounted on each of said arms; said base member being adapted to be secured to the housing of the tool, adjacent the shaping element such that the shaping element is located intermediate said first and second arms; and each of said guide members being movable relative to the base member to provide a variable guide adapted, in use of the attachment on a power tool, to engage a respective one of said mutually inclined adjacent surfaces of the workpiece and to guide the shaping element of the in relation to the workpiece, each guide member including a body portion by which it is mounted on its respective arm and at least one support means



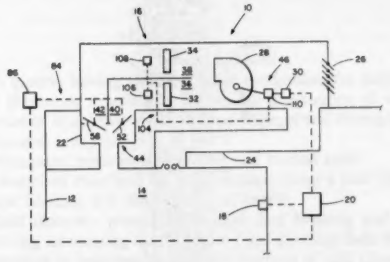
on which is mounted a roller for engaging the respective surface of the material to be worked; the support means being adjustable relative to the body portion laterally of the arm.

4,099,553

VARIABLE AIR VOLUME SYSTEM

Roger R. Burnham; Merlin K. Chapin; David A. Cook; Theodore C. Gilles, all of Marshalltown, and Billy L. Williams, Montour, all of Iowa, assignors to Lennox Industries, Inc., Marshalltown, Iowa

Filed Feb. 11, 1977, Ser. No. 767,955
Int. Cl.[2] F24F *3/00*
U.S. Cl. 165—22 **12 Claims**



1. In an air processing system for conditioning air enclosure of the type including an air mover, thermostatic means for sensing the temperature of said enclosure, a first deck, a second deck and duct means for interconnecting said enclosure and said air mover, said duct means having a first passage and a second passage communicating with said first deck and said second deck, respectively, an improvement comprising, in combination:

a shaft rotatably mounted to said duct means, said shaft extending substantially through said first passage and said second passage and beyond said duct means to define a shaft control portion, said shaft including a shaft actuating arm secured to said shaft control portion;

a first damper element secured to said shaft within said first passage;

a tube rotatably mounted on said shaft, said tube extending substantially through said second passage and beyond said duct means to define a tube control portion, said tube including a tube actuating arm secured to said tube control portion;

a second damper element secured to said tube within said second passage;

stop means for detachably securing said shaft and said tube in a first shaft position and a first tube position, respectively;

drive means for driving said first damper element and said second damper element in response to said thermostatic means, said drive means including a shaft drive arm and a tube drive arm adapted to engage said shaft actuating arm and said tube actuating arm, respectively, said shaft, said tube and said drive means cooperatively defining attachment means for detachably securing said shaft actuating arm and said tube actuating arm to said shaft drive arm and said tube drive arm, respectively; and

volume control means for variably operating said air mover in response to said first damper element and said second damper element;

said shaft and said tube being operable in a first mode wherein said shaft actuating arm is detachably secured to said shaft drive arm and said tube is detachably secured in said first tube position by said stop means, a second mod' wherein said shaft actuating arm and said tube actuating arm are detachably secured to said shaft drive arm and said tube drive arm, respectively, and a third mode wherein said shaft is detachably secured in said first shaft position by said stop means and said tube actuating arm is detachably secured to said tube drive arm.

4,099,554

CONTROL SYSTEM TO REGULATE THE WALL TEMPERATURE OF A PRESSURE VESSEL

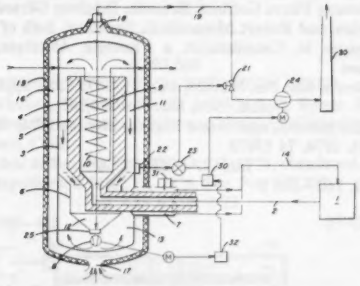
Egon Haese, Bochum, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Dec. 20, 1976, Ser. No. 752,295

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2557085

Int. Cl.[2] G05D *23/00*

U.S. Cl. 165—32 **5 Claims**



1. In a pressure vessel adapted to receive a flow of hot rare gas such a helium from a nuclear reactor, said pressure vessel including an outer layer of insulation, an outer pressure jacket spaced inwardly from said layer of insulation to form an airgap therebetween, a chimney coupled by a conduit line to an aperture in the top of said outer layer of insulation which further includes a bottom aperture, an inner jacket having an open top and a conical bottom end disposed within said outer pressure jacket to form an annular chamber therebetween, a layer of insulation supported by said inner jacket, a conical apron including a bottom opening surrounding the conical bottom end of said inner jacket, said conical apron separating said annular chamber between said inner jacket and said outer pressure jacket to define a bottom chamber in said outer pressure jacket, said bottom chamber communicating with an outlet conduit which surrounds an inlet conduit for feeding hot rare gas into the conical bottom end of said inner jacket, the arrangement of parts being such that hot rare gas from a nuclear reactor passes from said inlet conduit to flow upwardly within said inner jacket and then downwardly along said annular chamber to enter said bottom chamber and pass into said outlet conduit, the combination therewith of a control system including the combination of:

a thermocouple supported for response to the temperature of the outer wall of said outer pressure vessel within said airgap to produce a temperature signal corresponding thereto,

a controller receiving said temperature signal to produce a control signal corresponding to the development of a predetermined excessive outer wall temperature of said outer pressure vessel, and

control means responsive to said control signal to both maintain continuous airflow and adjustably control the flow of air delivered by the conduit line into said chimney from said airgap through the top aperture in said outer layer of insulation.

4,099,555

CONVECTOR HAVING A FLATTENED PLASTIC TUBE SPIRAL

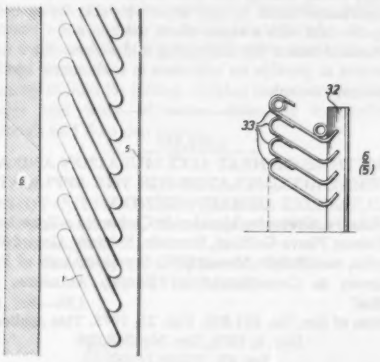
Peter Heinrich Erwin Margen; Jan Anders Bosaeus, both of Nykoping, and Bengt Olof Roland Skårud, Vasteras, all of Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Dec. 8, 1975, Ser. No. 638,546

Claims priority, application Sweden, Dec. 18, 1974, 7415956

Int. Cl.[2] F24H *9/08*

U.S. Cl. 165—55 **5 Claims**



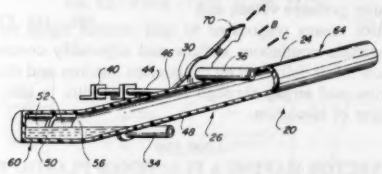
1. A wall mountable tube convector for heating air wherein air is heated by contact with hot tubes and rises by convection, said convector comprising a hot liquid conducting plastic tube of high thermal stability formed into a plurality of tube windings extending in the form of a vertically oriented flattened helix having a central, axially extending vertical plane parallel to the flattened sides of the helix, all the helix windings being arranged in parallel planes intersecting said central vertical plane along substantially horizontal lines and extending obliquely to the horizontal, tube spreaders between the windings arranged to maintain said windings in a predetermined shape and at predetermined mutual intervals, the first mounting means cooperating with the tube windings for mounting said tube on a wall spaced a distance from said wall, a screen enclosing said tube coils, and second mounting means for mounting said screen on said tube coils spaced a distance from said coils, said screen, in cooperation with the wall, forming an open-ended chimney around said tube coils, whereby said first and second mounting means produce a double flue effect to permit every part of the spiral to be exposed to a substantially unobstructed, uniform airflow in and about said coils to increase heat transfer.

4,099,556

VARIABLE THERMAL CONDUCTANCE REFLUX HEAT PIPE

Charles C. Roberts, Jr., 27 W. 776 Greenview, Warrenville, Ill. 60555

Filed May 23, 1977, Ser. No. 799,454
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—96 4 Claims



1. Thermal transfer apparatus comprising reflux heat pipe means,

said heat pipe means including:

an evaporator section,

slab wicks of various depths disposed in said evaporator section for contacting a liquid puddle in said evaporator section of said pipe means,

an adiabatic center section and an upper condenser section,

said adiabatic center section having a deformable zone,

closure means sealing said pipe means at each end,

a vaporizable liquid in said apparatus, said liquid being in equilibrium with a vapor phase thereof, and

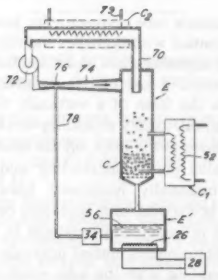
mechanical means for deforming said deformable adiabatic section to provide an inflection in said central section of said pipe means.

4,099,557

METHOD OF HEAT ACCUMULATION AND A THERMAL ACCUMULATOR FOR THE APPLICATION OF SAID METHOD

Alain Bricard, Grenoble; Maurice de Cachard, La Tronche, both of France; Pierre Goffinet, Brussels, Belgium; Gerard Kurka, Meylan, and Robert Moracchioli, Seyssinet, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 551,828, Feb. 21, 1975. This application Dec. 6, 1976, Ser. No. 748,006
Int. Cl.[2] F28D *21/00*
U.S. Cl. 165—104 S 2 Claims



1. A thermal accumulator wherein a heat transporting fluid F is passed in direct contact over a material C having a high latent heat of fusion comprising:

a vessel E containing a portion of the material C in the form of a bed of solid granules and the fluid F, said vessel E having an upper end and a lower end;

a vessel E' which communicates with the lower end of the vessel E, the vessel E' containing a portion of the material C in a molten liquid state, said vessel E' having an upper end and a lower end;

a first pumping circuit including a first pipe having one end extending into the vessel E, a first pump connected to the other end of said first pipe;

a convergent-divergent venturi tube having its divergent end opening in the vicinity of the upper end of the vessel E, the convergent end of the venturi tube being in the vicinity of the first pump, part of the first pipe constituting a primary circuit of a heat exchanger C_2, the fluid F circulating in the primary circuit, heat energy being extracted by an associated secondary circuit of the heat exchanger C_2;

a second circuit constituted by a second pipe fitted with a filter, said second circuit connecting the lower end of the vessel E' to the throat of the venturi tube, the molten liquid material C store in the vessel E' being supplied to the throat of the venturi tube via the second circuit; and

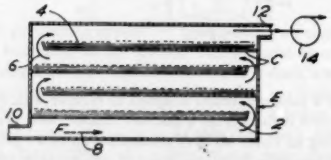
a third circuit for pumping fluid F to circulate the fluid F through the granules of material C in the vessel E constituted by a third pipe and a second pump, an end of said third pipe being connected to an opening formed in the vessel E above the maximum level of the bed of solid granules of material C, the other end of the third pipe being connected to an inlet located in the vicinity of the lower end of the vessel E, a mid-portion of the third pipe constituting the secondary circuit of a heat exchanger C_1, an associated primary of the heat exchanger C_1 including a hot liquid supply heat to the fluid F.

4,099,558

METHOD OF HEAT ACCUMULATION AND A THERMAL ACCUMULATOR FOR THE APPLICATION OF SAID METHOD

Alain Bricard, Grenoble; Maurice de Cachard, La Tronche, both of France; Pierre Goffinet, Brussels, Belgium; Gérard Kurka, Meylan, and Robert Moracchioli, Seyssinet, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 551,828, Feb. 21, 1975. This application Dec. 6, 1976, Ser. No. 748,007
Claims priority, application France, Mar. 1, 1974, 74 07079; May 31, 1974, 74 19072
Int. Cl.[2] F28D *21/00*
U.S. Cl. 165—104 S 3 Claims



1. A thermal accumulator having a high latent heat of fusion, wherein the accumulator comprises:

means for storing a material C having a high latent heat of fusion; and

means for circulating a heat-transporting fluid F so that the fluid F and the material C are in direct contact and exchange heat, the heat exchange being carried out essentially at a temperature close to the melting point of the material C, the means for storing including a leak-tight vessel containing a series of trays arranged in tiered stages, the trays containing the material C, the fluid F flowing about said trays in contact with a free surfaces of the material C, each of the trays including a horizontal capillary attached to its associated tray and located at the associated free surface of the material C, the material C and the heat trnasporting fluid F having substantially

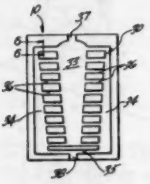
different densities and surface tensions at the melting point of the material C.

4,099,559

SOLAR ABSORBER PLATE DESIGN

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed May 10, 1976, Ser. No. 685,061
Int. Cl.[2] F28F 3/14, 9/22; F24J 3/02
U.S. Cl. 165—170 18 Claims



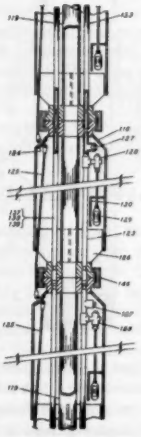
1. A heat exchange panel possessing a system of internal tubular passageways, said tubular passageways defining at least three generally tapered longitudinally extended headers, at least two of said longitudinally extended headers extending substantially the length of said panel, a connecting header located at one end of said panel transverse to and interconnecting longitudinally extended headers, and generally transversely extended connecting portions of said passageways, said connecting portions extending between longitudinally extended headers, and at least two fluid entry and exit portions longitudinally extending from at least two of said headers, wherein said longitudinally extended headers include a centrally located header offset by a pair of laterally displaced headers.

4,099,560

OPEN BOTTOM FLOAT TENSION RISER

William Fischer, Fullerton, Calif., and Virgil D. Rogge, Sumatra, Indonesia, assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 511,158, Oct. 2, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,233
Int. Cl.[2] E21B 7/12
U.S. Cl. 166—0.5 37 Claims



1. A buoyantly tensioned riser pipe in a body of water comprising:

an elongated riser pipe having a substantially central opening therethrough;

means for securing the upper end of said riser pipe to a drilling platform located in said water;

means for securing the lower end of said riser pipe to a water bottom connector;

float can means having a closed upper end and an open bottom end;

means for connecting the upper end of said float can means to said riser pipe concentrically, wherein said means for connecting is able to withstand a pressure exerted against said means for connecting;

a source of gas under pressure;

conduit means connecting said source of gas to the upper end of said float can means for injecting gas into said float can means whereby said gas is trapped in the closed upper end of said float can means to buoyantly tension said pipe;

a plurality of expansion guiding means connected to said riser pipe at the open end of said float can means for guiding said float can means along said guiding means during expansion and contraction of said float can means;

a normally closed fluid dump valve connected to the upper closed end of said float can means;

actuating means for operating said valve to open said dump valve in each of said float can means when said riser pipe parts;

slip joint means operatively connected to said drilling platform and said riser for allowing said riser to slide up and down;

supplementary tensioning means for providing additional tension when a water current is encountered;

means for connecting said supplementary tensioning means to said riser; and

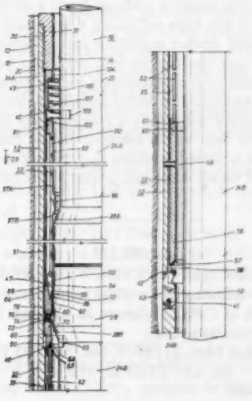
a plurality of lines for killing, choking and controlling a well under said body of water extending longitudinally through said float can means.

4,099,561

OVERSHOT CUTTER WITH FLEXIBLE RELEASE CAGE

Paul M. Nelson, Houston, Tex., assignor to Wilson Industries, Inc., Houston, Tex.

Filed May 11, 1977, Ser. No. 795,949
Int. Cl.[2] E21B 33/03
U.S. Cl. 166—55.1 7 Claims



1. Apparatus for severing a drill string from the exterior thereof, comprising:

a flexible inner member having a first abutment surface thereon;

an outer member concentrically disposed about said inner member, said outer member having a second abutment

surface thereon sized to receive said first abutment surface;

means for gripping a distended portion of a drill string disposed radially inwardly of said inner member, said gripping means being mounted on said flexible inner member for radial movement from a first, inner, position in which said gripping means is engageable by the distended portion of the drill string to obstruct axial movement of said overshot cutter with respect thereto to a second, radially outer, position in which said gripping means is axially movable with respect to the drill string;

said first and said second abutment surfaces being engagable to maintain said gripping means in said first, inner, position,

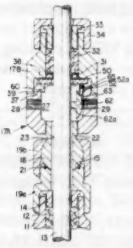
said outer member being axially movable relative to said flexible inner member to disengage and axially space apart said abutment surfaces and to define a radial clearance therebetween sufficient to permit said inner member to flex radially outwardly and to move said gripping means from said first, inner, to said second, radially outer, position.

4,099,562

DEVICE FOR LIMITING LEAKAGE FROM WELL HEAD STUFFING BOX ASSEMBLY

Roland W. Mattoon, P.O. Box 1302, Drayton Valley, Alberta, Canada

Filed Mar. 28, 1977, Ser. No. 782,281
Claims priority, application Canada, Feb. 7, 1977, 271174
Int. Cl.² E21B *33/03*
U.S. Cl. 166—84 **6 Claims**



1. A device for limiting leakage from a well head stuffing box assembly of the type including a vertically reciprocating polished rod, said device including means defining a chamber concentrically surrounding the rod, the upper end of the chamber being defined by a downwardly facing annular valve seat, said device including a flap valve member mounted within said chamber on a pivot carried by a ring member adjacent to said valve seat, said flap valve member being biased by spring means towards a closed position in which it seals against the valve seat, and being arranged normally to be held open by said rod.

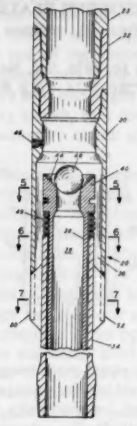
4,099,563

STEAM INJECTION SYSTEM FOR USE IN A WELL

Stanley O. Hutchison, Bakersfield, and Glenn W. Anderson, Oildale, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 31, 1977, Ser. No. 783,131
Int. Cl.² E21B *33/122, 43/12*
U.S. Cl. 166—191 **2 Claims**

1. A steam injection system comprising a tubing string, a steam deflector connected into said tubing string operable for initially directing steam flow down the interior of said tubing string into a well and later out of the steam deflector into the well liner-tubing string annulus in a direction concentric with and substantially parallel to the longitudinal axis of the tubing string, means for operating said steam deflector to direct steam flow out of said steam deflector into the well liner-tubing string annulus in a direction concentric with and substantially parallel to the longitudinal axis of the tubing string, downward looking packer cup means packing off the well liner-tubing string



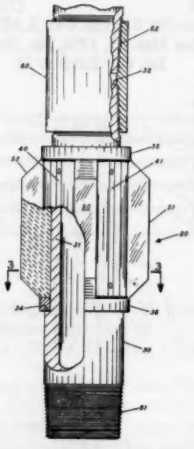
annulus above said steam deflector, upward looking packer cup means packing off said well liner-tubing string annulus below said steam deflector and steam generating means connected to said tubing string for flowing steam into said tubing string.

4,099,564

LOW HEAT CONDUCTIVE FRANGIBLE CENTRALIZERS

Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 19, 1976, Ser. No. 706,862
Int. Cl.² E21B *17/10*
U.S. Cl. 166—241 **8 Claims**



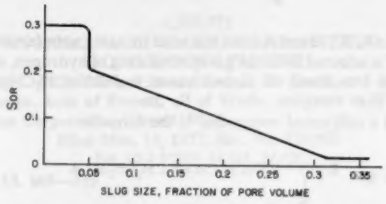
1. A centralizer for use in a tubing string comprising a central tubular section connectable into a tubing string, a plurality of radially extending polymerized frangible furfuryl alcohol impregnated prefired cordierite lugs in spaced apart position on the periphery of said tubular section for positively centralizing said tubular section, and means disconnectably connecting said lugs on said tubular section in said spaced apart position.

4,099,565

SINGLE WELL TRACER METHOD TO EVALUATE ENHANCED RECOVERY

Clyde Q. Sheely, Jr., and David E. Baldwin, Jr., both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 18, 1977, Ser. No. 778,920
Int. Cl.[2] E21B 43/22
U.S. Cl. 166—252 14 Claims



1. A process for obtaining data useful to evaluate the effectiveness of or to design an enhanced recovery process, the recovery process involving mobilizing and moving hydrocarbons through a hydrocarbon-bearing subterranean formation from an injection well to a production well by injecting a mobilizing fluid into the injection well, comprising sequentially:

(a) determining hydrocarbon saturation in the formation in a volume in the formation near a well bore penetrating the formation,

(b) injecting sufficient of the mobilizing fluid to mobilize and move hydrocarbons from a volume in the formation near the well bore penetrating the formation, and

(c) determining hydrocarbon saturation in a volume including at least a part of the volume of (b) by a single well tracer method.

4,099,566

VICOUS OIL RECOVERY METHOD

David A. Redford, Fort Saskatchewan, Canada, assignor to Texaco Exploration Canada Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 483,172, Jun. 26, 1974, Pat. No. 4,026,357. This application Mar. 4, 1977, Ser. No. 774,292
Int. Cl.[2] E21B 43/24
U.S. Cl. 166—260 11 Claims

7. A method of generating steam in a subterranean, porous, permeable earth formation, said formation also containing solid hydrocarbon fuel, said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with the formation, comprising:

(a) injecting from 1 to 20 gallons of liquid hydrocarbon fuel per foot of formation thickness into the formation via the injection well;

(b) injecting a free oxygen-containing gas into the formation via the injection well;

(c) heating the formation adjacent the injection well for a period of time sufficient to ignite the injected liquid hydrocarbon and solid hydrocarbon fuel present in the formation immediately adjacent the injection well;

(d) continuing injection of an oxygen containing gas into the formation for a period of time sufficient to propagate a high temperature forward combustion reaction zone at least halfway between the injection well and production well;

(e) thereafter discontinuing injection of air;

(f) injecting water containing suspended particulate matter and dissolved minerals into the injection well, said water contacting heated formation matrix materials and as a consequence thereof, being converted into steam; and

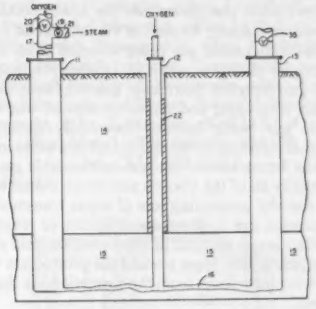
(g) recovering steam from the production well.

4,099,567

GENERATING MEDIUM BTU GAS FROM COAL IN SITU

Ruel Carlton Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed May 27, 1977, Ser. No. 801,223
Int. Cl.[2] E21B 43/24, 43/26; E21C 43/00
U.S. Cl. 166—261 9 Claims



1. A method of producing coal in situ comprising the steps of

sinking a first bore hole from the surface of the earth into an underground coal deposit,

sinking a second bore hole from the surface of the earth into the said underground coal deposit, the said second bore hole being spaced apart from the said first bore hole,

establishing hermetic seals within the said first and second bore holes,

establishing a communication passage through the said underground coal, the said communication passage being in fluid communication with the said first bore hole and the said second bore hole, the said communication passage through the said underground coal being accomplished by

lowering a perforating gun into the said first bore hole, the said perforating gun being positioned within the said underground coal and the said perforating gun being aligned toward the said second bore hole, then

firing a first projectile from the said perforating gun;

removing the said perforating gun from the said first bore hole,

lowering the said perforating gun into the said second bore hole, the said perforating gun being positioned within the said underground coal and the said perforating gun being aligned toward the trajectory of the said first projectile fired from the said first bore hole, then

firing a second projectile from the said perforating gun, and

removing the said perforating gun from the said second bore hole, and

further including the enlargement of the said communication passage through the said underground coal, comprising the steps of

injecting oxygen in the said first well bore,

igniting the said coal in the said second well bore,

continuing injections of the said oxygen until the underground fire burns through to the said first well bore.

4,099,568

METHOD FOR RECOVERING VISCOUS PETROLEUM

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 442,944, Feb. 15, 1974, abandoned. This application Dec. 22, 1976, Ser. No. 753,659
Int. Cl.[2] E21B 43/24
U.S. Cl. 166—269 15 Claims

1. A method of recovering viscous petroleum including bitumen from a subterranean, viscous petroleum-containing formation including a tar sand deposit, said formation being

penetrated by at least one injection well and by at least one production well, said injection well containing at least two separate flow paths, the first being in fluid communication with the upper portion of the petroleum formation and the second being in fluid communication with the lower portion of the formation, comprising:

(a) injecting steam into the upper portion of the formation via the first flow path; and

(b) injecting a gas which is non-condensable and non-oxidizing at formation conditions into the lower portion of the petroleum containing formation via the second flow path, said non-condensable gas being selected from the group consisting of nitrogen, methane, ethane, propane, butane, natural gas, liquefied petroleum gas, ethylene, propylene, butylene, hydrogen, and mixtures thereof, said non-condensable gas being injected essentially simultaneously with steam injection so the steam and non-condensable gas mix in the formation and the non-condensable gas contacts substantially all of the viscous petroleum contacted by the steam, thereby preventing loss of steam transmissibility in the formation due to steam condensation or creation of an immobile viscous oil bank in the formation, said steam and gas displacing petroleum toward the production well; and

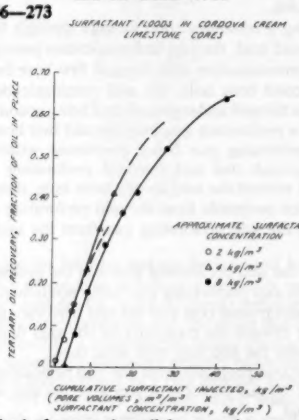
(c) recovering petroleum from the formation via the production well.

4,099,569

OIL RECOVERY PROCESS USING A TAPERED SURFACTANT CONCENTRATION SLUG

Issam S. Boussaid, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,679
Int. Cl.[2] E21B 43/22
U.S. Cl. 166—273 **9 Claims**



1. A method of recovering oil from a subterranean oil-bearing formation having in communication therewith at least one injection well and at least one production well comprising:

(a) injecting into the formation via the injection well a slug of a surfactant solution;

(b) injecting water into the formation via the injection well; and

(c) recovering oil from the formation via the said production well and wherein the concentration of the surfactant in the said slug is increased as the slug is injected into the said formation, wherein the water injected in step (b) contains dissolved therein a small amount of a solubilizing agent selected from the group consisting of:

(a) a compound of the formula:

$$R-\underset{\displaystyle R''}{\overset{|}{N}}-R'O(CH_2CH_2O)_mA$$

wherein R is alkyl of from 1 to about 16 carbon atoms; wherein R' is alkylene of from 2 to 4 inclusive carbon atoms; *m* is an integer of from 8 to about 60; A is selected from the group consisting of hydrogen, sodium, potassium and the ammonium ion and wherein R'' is selected from the group consisting of hydrogen, alkyl of from 1 to about 16 carbon atoms and $R'O(CH_2CH_2O)_mA$;

(b) a sulfated compound of the formula:

$$R-\underset{\displaystyle R''}{\overset{|}{N}}-R'O(CH_2CH_2O)_mSO_3A$$

wherein R, R', *m* and A have the same meaning as in (a) above, and R'' is selected from the group consisting of hydrogen, alkyl of from 1 to about 16 carbon atoms and $R'O(CH_2CH_2O)_m SO_3A$, and

(c) a sulfonated compound of the formula:

$$R-\underset{\displaystyle R''}{\overset{|}{N}}-R'O(CH_2CH_2O)_nCH_2CH_2SO_3A$$

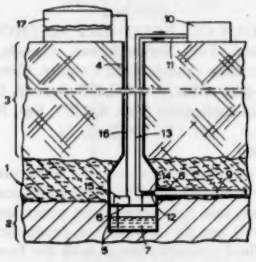
wherein R, R' and A have the same meaning as in (a) above; wherein *n* is an integer of from about 8 to about 60 and R'' is selected from the group consisting of hydrogen, alkyl of from 1 to about 16 carbon atoms and $R'O(CH_2CH_2O)_n CH_2CH_2SO_3A$.

4,099,570

OIL PRODUCTION PROCESSES AND APPARATUS

Donald Bruce Vandergrift, 264 Silverbrook Way N.W., Calgary Alberta, Canada

Filed Jan. 28, 1977, Ser. No. 763,331
Claims priority, application United Kingdom, Apr. 9, 1976, 14571/76
Int. Cl.[2] E21B 43/24
U.S. Cl. 166—303 **9 Claims**



1. An oil recovery string for use in recovering oil from a natural oil-bearing formation with the aid of thermal energy supplied by a fluid-heating medium, said string comprising a tubular heat-conducting casing having oil entry apertures disposed at intervals therealong, an oil-receiving pipe located within said casing and having peripheral openings in sealed communication with said oil-receiving apertures in the casing, and wherein between said casing and said oil-receiving pipe there is a passageway along which heated fluid medium can be circulated in heat-exchange relationship with the casing.

4. A process for recovery of oil from a natural oil-bearing formation utilising thermal energy supplied by a fluid heating meadium to cause or accelerate flow of oil from the formation into an oil recovery duct, with the improvement that in a direction along the formation there is installed at least one composite heating and oil recovery string having a heat conducting casing within which there is at least one passageway for conducting fluid heating medium along the string in heat exchange relationship with such casing, and within which

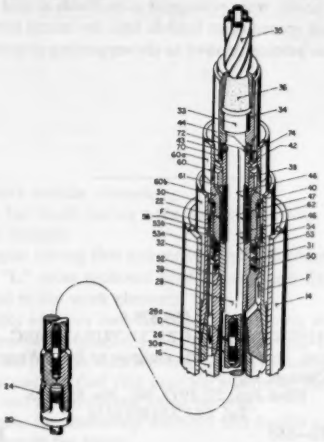
casing there is also at least one duct for conducting oil along the string, the said casing having peripheral oil entry apertures at intervals therealong (via) which apertures are in sealed communication with (the) said oil-receiving duct located within said casing, (is in communication with the formation,) and fluid heating medium is (circulated) forced along said heating passageway to heat a volume of the oil-bearing formation by heat transfer from the string so that oil is caused to gravitate from the formation into said oil-receiving duct via said oil entry apertures.

4,099,571

DOWN HOLD PACKING GLAND AND METHOD FOR LONG STROKE PUMPER

Alfred L. Hollenbeck, Sultan; Alison V. De Tuerk, and John T. Cooper, both of Everett, all of Wash., assignors to Western Gear Corporation, Everett, Wash.

Filed Mar. 14, 1977, Ser. No. 776,950
Int. Cl.[2] E21B *33/03, 23/00*
U.S. Cl. 166—315 **10 Claims**



1. Apparatus for releasably sealing a well hole at a location below ground surface comprising

cylindrical production tube means extending into the well hole,

a stuffing gland located in the production tube means several feet below the ground surface, said stuffing gland including an internal packing and an outer surface,

a polish rod reciprocably mounted in engagement with the internal packing within the stuffing gland,

an inner casing between the stuffing gland and the production tube means,

resilient sealing and locking means separate from said internal packing and between the inner casing and said outer surface of the stuffing gland, and

means extending above ground for radially expanding the sealing and locking means for sealing against production fluids passing between the inner casing and the outer surface of the stuffing gland and holding the stuffing gland in position below the ground surface.

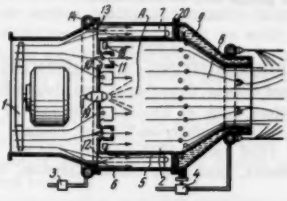
7. The method of sealing and locking and removing a packing gland, having an internal packing, around a polish rod below ground in a well hole comprising radially expanding an elastomeric sealing and locking member separate from said internal packing into tight engagement between the packing gland and a stationary tube extending down from the top of the well hole externally of the packing gland; the step of expanding including rotating a second tube from above the ground surface and screwing the second tube downwardly into engagement with the elastomeric sealing and locking member for axially compressing the member to cause it to radially expand, unscrewing the second tube from above the ground surface to relax the elastomeric member and release the packing gland, withdrawing the packing gland, and separately adjusting the internal packing on the polish rod.

4,099,572

VAPOR-GAS MIXTURE GENERATING INSTALLATION FOR EXTINGUISHING UNDERGROUND FIRES

Valentin Vasilievich Vasilenko, ulitsa Levitskogo, 23, kv. 2; Leonid Denisovich Vishnevsky, ulitsa Levitskogo, 27, kv. 8; Viktor Matveevich Zvenyachkin, ulitsa Polotskaya, 20, kv. 55; Anatoly Ivanovich Ivchenko, Komsomolsky prospekt, 27, kv. 33; Mikhail Vasilievich Kolyshenko, ulitsa Artema, 161, kv. 6, all of Donetsk, and Evgeny Petrovich Fedorov, Federativny prospekt, 4, kv. 7, Moscow, all of U.S.S.R.

Filed May 7, 1976, Ser. No. 684,470
Int. Cl.[2] A62C *13/52*
U.S. Cl. 169—12 **1 Claim**



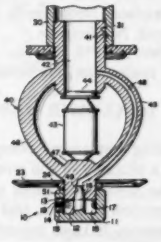
1. A vapor-gas mixture generating installation for extinguishing fires, comprising a blower, a combustion chamber having a restricted section in the direction of gas flow leaving an engine, a fuel system, and a water supply system to cool the restricted section of the combustion chamber and to cool and humidify the combustion products, said combustion chamber before its restricted portion comprising two concentric tubes provided at the outlet with a common vertical wall portion with passages for fuel and air supply into an annular space between the tubes, which is sealed off by a wall at the outlet and divided by longitudinal partitions located at the passage sides into two-way ducts with openings on the inner tube near the vertical wall portion, long partitions extending from the vertical wall portion to the sealing wall, alternating with shorter partitions adjoining the vertical wall portion only, wherein said short partitions are arranged along a helical line normal to the tube surfaces.

4,099,573

SPRINKLER HEAD

Tamotsu Sahara, Tokyo, Japan, assignor to Hitachi Plant Engineering and Construction Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,542
Claims priority, application Japan, May 13, 1976, 51-54973
Int. Cl.[2] A62C *37/08*
U.S. Cl. 169—37 **11 Claims**



1. A device for confirming water pressure in sprinkler heads

of the type including two forking arms connected to a head pipe near the area of junction with a water delivery pipe at one end and coupled at the other end to a part that supports a heat-sensing component, comprising:

a branch passageway connected with said head pipe of said sprinkler head which sprinkles water during a fire due to the activation of said heat-sensing component, said branch passageway being drilled through at least one of the two forking arms such that it communicates with said part that supports said heat-sensing component;

a valve means which opens and closes the branch passageway by contact with, and separation from, said passageway;

a restraining part which holds said valve in said passageway such that said valve is removed from the branch passageway when said restraint is loosened; and

a pressure detection port provided in said restraining part and connected with said branch passageway when the branch passageway is opened by said valve, and to which pressure gauge may be connected.

4,099,574

FIRE-FIGHTING COMPOSITIONS

Gerald Edward Cooper, Crowthorne, and Robert Eugene Stratton, Brentford, both of England, assignors to Chubb Fire Security Limited, Sunbury-on-Thames, England

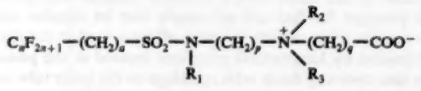
Filed Apr. 4, 1977, Ser. No. 784,398

Claims priority, application United Kingdom, Apr. 6, 1976, 13823/76

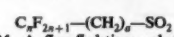
Int. Cl.² A62C *1/02*; C09K *3/28*

U.S. Cl. 169—47 **27 Claims**

1. A fire fighting concentrate comprising an aqueous solution of (a) less than 2% by weight of perfluoro surfactant, (b) from 1 to 9 parts by weight, per part by weight perfluoro surfactant, of a fluorine-free surfactant, and (c) glycol or glycol ether solvent for the perfluoro surfactant, and in which the perfluoro surfactant comprises an ampholytic fluorinated sulphonamide having the general formula



wherein *n* represents an integer of from 1 to 20, *a* represents an integer of from 2 to 10, *q* represents an integer of from 0 to 10, *p* represents an integer from 0 to 10 and each of R_1, R_2 and R_3, which they be the same or different, are hydrogen, C_{1-6}alkyl or



24. A fire-fighting solution made by mixing one part of a concentrate according to claim 1 with about 16 parts water.

26. A method of fighting a hydrocarbon fire comprising applying to the hydrocarbon a fire-fighting liquid according to claim 24.

4,099,575

SOIL CULTIVATING IMPLEMENTS

Ary van der Lely, Maasland, Netherlands, assignor to C. van der Lely N.V., Maasland, Netherlands

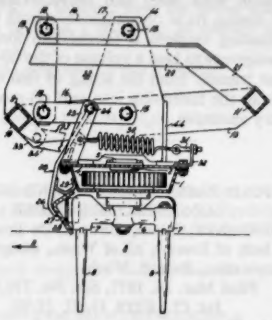
Filed Dec. 2, 1976, Ser. No. 746,805

Claims priority, application Netherlands, Dec. 2, 1975, 7514005

Int. Cl.² A01B *33/06*

U.S. Cl. 172—59 **13 Claims**

1. A soil cultivating implement comprising a supporting frame structure and a plurality of soil working members rotatably mounted on an elongated frame portion that extends transverse to the direction of travel, said supporting structure including bracket means, linkage assemblies interconnecting said bracket means with at least one upwardly extending support secured to said frame portion, said linkage assemblies comprising vertically spaced apart links with pivots and said frame portion together with the soil working members being displaceable vertically with respect to the supporting structure



about said pivots, stops positioned to each side of said support, between said spaced apart links to limit the lateral movements of the frame portion relative to the supporting structure.

4,099,576

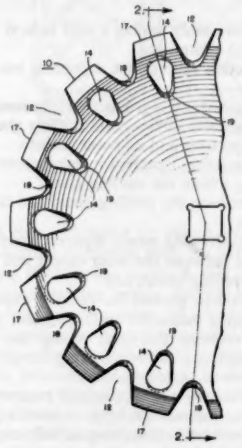
HIGH-SPEED AGRICULTURAL DISC

Atiq A. Jilani, Oak Lawn, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 27, 1977, Ser. No. 810,125

Int. Cl.² A01B *15/16*

U.S. Cl. 172—555 **11 Claims**



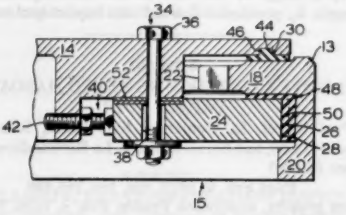
1. A circular, dished earth-cutting agricultural disc having a series of equally-spaced, generally V-shaped notches around its circular periphery, with a radially-extending, generally ovate-shaped opening between each pair of adjacent notches, the wider end of each opening being radially outermost and extending outwardly beyond the bottoms of the notches.

4,099,577

WORK VEHICLE AND RING GEAR BEARING ARRANGEMENT THEREFOR

Joel M. Beckham; Gene B. Easterling; Reginald K. Ringel, all of Decatur, and Egon E. Wolff, Forsythe, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 17, 1977, Ser. No. 778,652
Int. Cl.[2] E02F 3/76
U.S. Cl. 172—781 7 Claims



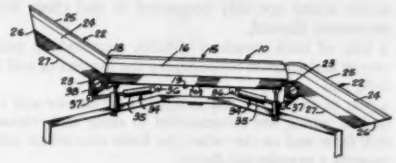
1. A work vehicle, comprising:
a draw bar frame having a plurality of recesses;
a work element;
a ring gear having first and second legs and being of a general "L" cross sectional configuration and fixedly connected to the work element;
a plurality of shoes each having an end having at least one slot extending generally vertically along the end in the installed position with the shoe movably connected to the frame and the first ring gear leg positioned between the shoe and an overlaying frame portion;
first means for selectively movably and fixedly connecting the shoe to the frame;
second means for controllably moving the shoe toward and from the ring gear;
a plurality of first bearing strips positioned between and in load bearing contact with the first leg of the ring gear and the overlaying frame portion, each of said first bearing strips having at least one portion of a construction sufficient for generally vertically insertion into a respective recess, generally vertical removal from said recess, and for maintaining said first bearing strip against generally horizontal movement relative to said frame in response to preselected forces subjected thereon by the ring gear, said first bearing strips being formed of organic plastic having fiberglass strands and being of a thickness sufficient for maintaining the ring gear spaced from the overlying frame; and
a plurality of second bearing strips each being of a general "L" cross sectional configuration and positioned over an end portion of a respective shoe and between and in load carrying contact with said shoe and the first and second legs of the ring gear, each of said second bearing strips having at least one lug of a construction sufficient for insertion into a respective generally vertical shoe slot, removal from said slot, and for maintaining said second bearing strip against generally horizontal movement relative to said shoe in response to forces subjected thereon by the ring gear, said second bearing strip being formed of organic plastic having fiber glass strands and being of a size sufficient for maintaining the ring gear spaced from all portions of the shoe.

4,099,578

HINGED BULLDOZER BLADE

John L. Stevens, P.O. Box 374, Eureka, Mont. 59917

Filed Feb. 10, 1977, Ser. No. 767,440
Int. Cl.[2] E02F 3/76
U.S. Cl. 172—802 5 Claims



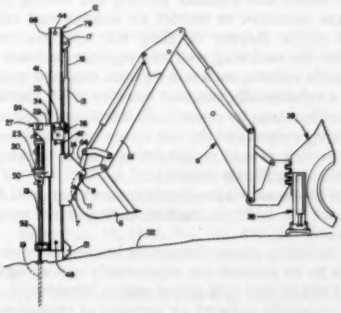
3. A selectively adjustable earth moving blade for a bulldozer or like vehicle, comprising:
a first blade section adapted for mounting to a vehicle, said first blade section having a forwardly facing concave surface along vertical planes across the width thereof;
a second blade section having a forwardly facing concave surface across the width thereof matching the concave surface of the first blade section;
upright hinge means joining one end of said first blade section to one end of said second blade section for relative pivotal motion with respect to one another about an upright hinge axis;
said upright hinge means including interfitting complementary paired concave and convex end surfaces integral with said first and second blade sections;
each end surface being tangential to the concave surface of the blade section on which it is formed and each pair of concave and convex end surfaces having substantially common radial dimensions relative to the upright hinge axis, whereby a uniform narrow gap is maintained between the blade sections while permitting relative pivotal movement of one blade section relative to the other about the upright hinge axis.

4,099,579

DRILL MOUNTING DEVICE FOR BACKHOE ATTACHMENTS

Harry J. Stormon, 908 Camino Real, Sparks, Nev. 89431

Filed Feb. 9, 1977, Ser. No. 766,937
Int. Cl.[2] B23Q 5/00
U.S. Cl. 173—4 7 Claims



1. A drill mounting device for backhoe attachments comprising:
a. attachment means removably affixed to the end of said backhoe and formed with a slide rail;
b. an elongated mast slidably mounted on said attachment means and formed with a slide rail;

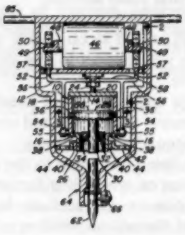
c. power means connected to said attachment means and said mast for controlled lowering and raising of said mast;
d. a tool carrier slidably mounted on said mast slide rail and formed with a handle holding member adapted for removably holding the handle portion of said drill;
e. a chain loop mounted on said mast and connected to said carrier;
f. motor means operably connected to said chain loop for movement thereof;
g. a pair of latch members slidably mounted on said tool carrier and adapted for engaging the handles of said sinker drill; and
h. a pair of shear pins connected to said carrier and to said latches which are dimensioned to shear and release said drill from said carrier when the force exerted on said drill exceeds a preselected force.

4,099,580

IMPACT DEVICE WITH LINEAR AIR SPRING

Frederick W. Ross, 755 Klamath Dr., Del Mar, Calif. 92014

Filed Jan. 24, 1977, Ser. No. 762,003
Int. Cl.[2] B25D 9/00
U.S. Cl. 173—118 15 Claims



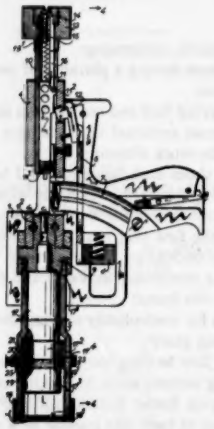
1. An impact device comprising:
a frame,
exciter-reciprocative means operatively mounted on said frame, and having a reciprocating output reciprocating at a working rate of impacting,
a resilient coupler operatively mounted for reciprocation on said frame, said resilient coupler comprising an enclosing wall including a cylinder portion with end elements forming a total enclosed space substantially confining a selected quantity of air therein, and ram means comprising a piston with at least one shaft thereon extending in slidable sealed relation through an associated one of said end elements, said piston fitted for slidable reciprocation axially within said cylinder portion and having piston seal means operative to restrict air leakage past said piston, said piston thereby dividing the total enclosed space within the enclosing wall into separate enclosed spaces of variable volume, each said separate enclosed space confining a substantially constant quantity of air therein,
said resilient coupler operatively interconnecting said reciprocating output and the ram means to transmit reciprocating motion of said reciprocating output to reciprocating motion of said ram means,
impact tool means operatively mounted on said frame for impact by said ram means during each reciprocation thereof,
flow restricting passage means for limiting compensating air flow to an amount not substantially exceeding imminent air leakage past said piston and to substantially maintain the varyingly reduced air pressure of expansion alternatingly occurring during each cycle of operation in each said separate enclosed space, thereby to substantially maintain doubly acting air spring stiffness of said resilient coupler,
said flow restricting passage means comprising one or more openings through said enclosing wall at one or more selected points through which said compensating air is put alternately into and out of each said separate enclosed space by action of said piston reciprocation to compensate for air leakage past the piston seal means to stabilize the piston mid-excursion point during operation, wherein the improvement comprises:
said total enclosed space having total internal open volume Ah, with said piston positioned to divide said total enclosed space into two substantially equal separate enclosed spaces and A is the cross-sectional area of said cylinder portion, and
said one or more openings through said enclosing wall comprising one or more vents grouped about an effective vent flow area center thereof, such center positioned within the medial range of the half of the total equivalent open length, h_p positioned toward said impact tool means.

4,099,581

EXPLOSIVE-CARTRIDGE POWERED HAMMER OR IMPACT TOOL

Jean Paul Maret, Le Boulevard Karl Marx, Saint-Etienne, France (42100), and Bernard Maret, La Bertrandiere, L'Etrat, France (42580)

Filed Feb. 8, 1977, Ser. No. 766,586
Claims priority, application France, Feb. 9, 1976, 76 04229
Int. Cl.[2] B25D 9/00
U.S. Cl. 173—133 12 Claims



1. An explosive-cartridge powered hammer or impact tool comprising:
a breech member adapted to receive an explosive-cartridge;
means to lock said explosive-cartridge in said breech member and to fire said explosive-cartridge;
grip means;
resilient means connecting said grip means to said breech member, said resilient means comprising means permitting and guiding said breech member to slide smoothly back and forth with respect to said grip means in a direction parallel to the axis of said breech means, a pair of damping rings, each defining one of the limits of travel of said breech member and each returning said breech member away from said limit of travel, when said breech member is forced towards said limit of travel;
whereby said grip means resiliently supports said breech member;
a barrel sleeve fastened to the breech member, so as to receive in its bore the burning gases from the explosive-cartridge when said explosive-cartridge is fired;
piston means slidable in the bore of said barrel sleeve in gas-tight relationship, whereby, when said explosive-cartridge is fired, the piston is driven by the burning gases

from a rearward position forward along the bore of said barrel sleeve to a forward position;

an impact head carried by the fore end of said piston for impacting on an impact-receiver;

said impact head protruding beyond said barrel sleeve during impact;

means to retract said piston to its rearward position, said means comprising sealed expandable-compressible chamber means formed between said piston and said bore, said chamber means decreasing in volume as said piston is driven to its forward position, whereby air therein is compressed and tends to drive said piston back to its rearward position; and

detent means to retain said piston in its rearward position until an explosive-cartridge is fired.

4,099,582

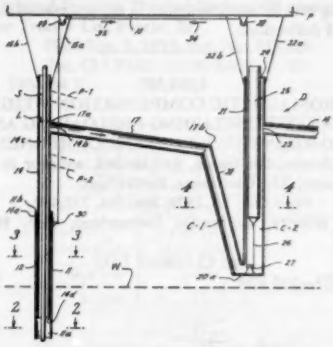
DRILLING FLUID COMPENSATION DEVICE

Leo A. Bell, Houston, Tex., assignor to Martin-Decker Company, a division of Gardner-Denver, Santa Ana, Calif.

Continuation-in-part of Ser. No. 720,199, Sep. 3, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,564

Int. Cl.[2] E21B *7/12*

U.S. Cl. 175—5 **21 Claims**



1. In an offshore oil well drilling system wherein a drilling platform is subjected to wave and tide action causing such platform to heave and wherein the drill string therefor is housed in a marine riser which is connected to the platform through a telescoping connection having a return flowline, the annular area between said marine riser and the drill string serving as a return path for drilling fluid, the flow of such returning drilling fluid through such return flowline being affected by the heave of the drilling platform, a drilling fluid flow compensator, comprising:

a telescoping cylindrical member adapted for mounting in said marine riser and for connection with such platform for slidable, sealed movement in said marine riser in response to heave of such platform from wave action, said telescoping cylindrical member having a return flowline connected therewith for receiving such returning drilling fluid from said marine riser and telescoping cylindrical member; and

volume compensation means connected with said return flowline for substantially neutralizing the effect of wave and tide action on the flow of such return drilling fluid through said return flowline.

4,099,583

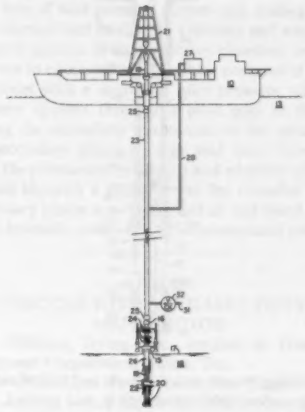
GAS LIFT SYSTEM FOR MARINE DRILLING RISER

Leo Donald Maus, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Apr. 11, 1977, Ser. No. 786,529

Int. Cl.[2] E21B *15/02, 7/18*

U.S. Cl. 175—7 **9 Claims**



1. In an apparatus for drilling a well through subterranean formations beneath a body of water from the surface of said body of water, said apparatus comprising a riser pipe extends from the surface to a subsea wellhead and a drill string which passes through said riser pipe and into a borehole under the body of water, the improvement comprising:

gas injection means for lifting drilling fluid in said riser pipe to the surface to reduce the pressure of the drilling fluid so that there exists a differential pressure between the drilling fluid and said body of water; and

valve means positioned near the lower end of said riser pipe for providing an influx of seawater into said riser pipe in response to said differential pressure so that the pressures of the drilling fluid and said body of water approximately equalize while the pressure of the drilling fluid in the borehole stabilizes at a level which is below the fracture pressure of the formations.

4,099,584

FLAME JET TOOL FOR DRILLING TO GREAT DEPTHS

Helmut Frankle, and Werner Baum, both of Canoga Park, Calif., assignors to Pei, Inc., Canoga Park, Calif.

Filed Jun. 10, 1976, Ser. No. 694,665

Int. Cl.[2] E21B *7/14*

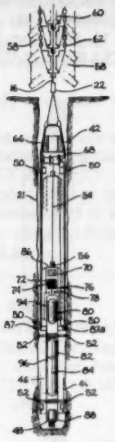
U.S. Cl. 175—14 **27 Claims**

1. A flame jet tool for drilling a hole in the ground at great depths comprising:

(a) a flame jet lance having a drill bit and an associated self-contained fuel system disposed in said lance, said fuel system including at least one fuel tank coupled to said drill bit such that fuel is caused to travel from said tank to said drill bit;

(b) a sheath circumferentially disposed about said lance, said

lance being configured in said sheath such that said lance is slidably extendable therefrom; and



(c) positioning means on said lance and said sheath for preventing undesirable movement in said ground.

4,099,585

ROOF DRILLING SYSTEM

Kenneth C. Emmerich, Lexington, Ky., assignor to Fansteel Inc., North Chicago, Ill.

Filed Jan. 19, 1977, Ser. No. 760,712
Int. Cl.[2] E21B *17/00*
U.S. Cl. 175—320 3 Claims

1. A mining drill system which comprises:

(a) a bit body having a cutting end and a driving shank at the opposite end to interfit in driving engagement with a driving steel tube, said shank having a central bore terminating in openings in the body leading to the cutting end,

(b) a steel tube driver having an attachment at one end for a mechanical driving mechanism and having a socket at the other end to receive the shank of a bit in driving engagement, said bore of said bit body driving shank being in communication with the interior of said tube,

(c) said bit body shank and said socket having radially registering holes to receive a retainer to hold said body and driver together against tensioning forces,

(d) a plug-like retainer of deformable material in said holes to secure said shank and socket together, and

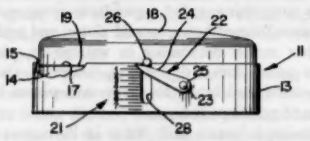
(e) said plug of deformable material having a flared split end with a diameter larger than said holes prior to being forced into said registering holes.

4,099,586

WEIGHT INDICATOR

John H. Bradner, Iron Mountain Rd., Warwick, N.Y. 10990

Filed Nov. 1, 1976, Ser. No. 737,772
Int. Cl.[2] G01G *3/00, 19/46*
U.S. Cl. 177—159 5 Claims



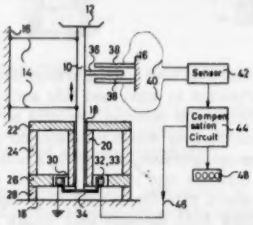
1. An individual portable weight indicating apparatus comprising an open top casing having a continuous side wall arising from a flat bottomed base and containing resilient means in the form of a solid column of elastomeric material fixed on said base and freely surrounded by said side wall, a relatively stiff weight application pad extending fixedly across the top of said column at the open top of the casing, the upper surface of said pad being adapted to support the weight of an individual standing on the apparatus and means for indicating vertical compression of said column in response to weight applied directly downwardly on the pad comprising an indicator member on the casing movable along an external scale on the casing, means on the pad for engaging and displacing said member downwardly along the scale as the column reduces in height in response to said downwardly applied weight, and means for maintaining said indicator member in the position of maximum downward deflection.

4,099,587

ELECTROMAGNETIC COMPENSATION WEIGHING APPARATUS INCLUDING PRELOADING AND LOAD-RESPONSIVE CURRENT COMPONENTS

Peter Kaufmann, Greifensee, Switzerland, assignor to Mettler Instrumente, AG, Greifensee, Switzerland

Filed Oct. 14, 1976, Ser. No. 732,480
Claims priority, application Switzerland, Nov. 18, 1975, 14903/75
Int. Cl.[2] G01G *7/00*
U.S. Cl. 177—210 EM 7 Claims



1. In a weighing system of the electromagnetic compensation type including a single load support means for supporting a load for movement from a normal first position relative to a stationary frame, sensing means for generating a signal that is a function of the extent of displacement of said load support means by the load from said first position, permanent magnet means connected with said frame to define an air gap relative to said load supporting means, compensation coil means including at least one compensation coil connected with said load support means and arranged within said air gap, compensating current supply means operable by said sensing means for supplying compensating current to said compensation coil means, and indicating means for indicating the magnitude of

the load as a function of the compensating current required to restore the load supporting means to the first position, the improvement wherein

(a) said compensating current supply means comprises

(1) a source of compensating current;

(2) preload modifying means adapted for circuit connection with said compensation coil means to vary the effective impedance thereof; and

(3) switch means for selectively connecting said compensation coil means and said preload modifying means with said compensating current source to divide the compensating current into a continuous first current portion which corresponds with up to about 90% of the preloading effect of said load support means, and a second portion that is periodically supplied to said coil means for periods of time that are a function of the magnitude of the load applied to said load support means plus the remainder of said preloading effect; and

(4) control means operable by said sensing means for operating said switch as a function of the position of said load support means;

(b) said indicating means being responsive only to said second compensating current portion, whereby said indicating means affords an indication of the load being weighed substantially independently of the no-load preloading effect of said load support means.

4,099,588

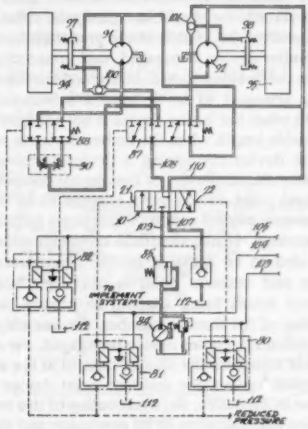
RESPONSIVE PILOT-OPERATED CONTROL VALVE FOR FRONT WHEEL DRIVE

Joseph Edward Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 1, 1976, Ser. No. 719,623

Int. Cl.[2] F16K *11/06*; B60K *17/02*

U.S. Cl. 180—44 F **12 Claims**



1. A directional control valve comprising:

a valve body having a longitudinally extending bore and a chamber at opposite ends of said bore communicating therewith, each of said chambers having an inward portion and an outward portion;

passage means in said valve body adapted to communicate said bore selectively with a source of fluid under pressure with a reservoir and with pressure-actuated devices;

a valve spool having oppositely disposed ends and being reciprocable within said bore to control communication between said passage means;

a primary piston reciprocable within each of said chambers and having a bore extending longitudinally between an inward end and an outward end to provide communication between the inward and outward portions of its respective chamber;

spring means continuously biasing each of said primary pistons inwardly toward said bore of said valve body to normally engage said spool and center said spool within said bore of said valve body;

a single secondary piston reciprocable within said bore of only one of said primary pistons and sealing against the bore thereof and having an outward end exposed to the outward portion of its respective chamber; and

pilot ports to communicate the outer portions of each of said chambers with a source of pilot pressure whereby pilot pressure applied through a pilot port to the chamber having the secondary piston acts on the outward end of the secondary piston to urge said spool inwardly away from the pressurized pilot port and whereby pilot pressure applied through a pilot port to the chamber lacking the secondary piston acts on the end of said spool to urge said spool inwardly away from the pressurized pilot port.

4,099,589

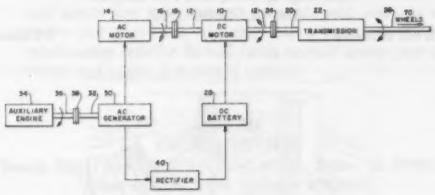
DC ELECTRIC CAR WITH AUXILIARY POWER AND AC DRIVE MOTOR

James R. Williams, Irving, Tex., assignor to Trans Research Development Corporation, Dallas, Tex.

Filed Dec. 20, 1976, Ser. No. 752,539

Int. Cl.[2] B60K *9/04*

U.S. Cl. 180—65 A **4 Claims**



1. In combination with an electrically powered motor vehicle of the type including a direct current storage battery and a direct current motor having an electrical input circuit connected to receive direct current from the battery and having a rotatable shaft mechanically coupled to drive traction wheels, the improvement which comprises:

an alternating current motor having an input circuit for receiving alternating current and a rotatable shaft mechanically coupled to drive the traction wheels in response to the flow of alternating current through the input circuit of the alternating current motor;

an alternating current generator having a rotatable shaft and an electrical output circuit connected to energize the input circuit of the alternating current motor, the generator being operable to produce alternating current in response to mechanical rotation of the generator shaft; and,

an internal combustion engine mechanically coupled to drive the generator shaft.

4,099,590

SOUND ATTENUATING ENGINE COVER

Robert P. Martin, Sr., 7809 W. 130th St., Parma, Ohio 44130

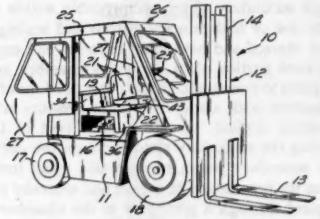
Filed Feb. 17, 1977, Ser. No. 769,318

Int. Cl.[2] B62D *25/10*

U.S. Cl. 180—69 C **10 Claims**

1. A lift truck including a chassis, an internal combustion engine mounted on the chassis, an operator's station including a seat and a steering wheel, an engine cover disposed between the engine and operator's station, said engine cover extending across a zone sufficiently large to intercept substantially all airborne noise originating at or immediately adjacent the engine and traveling in the direction of the operator's station,

components of said engine cover including an outer shell and in inner liner, said shell and liner each being thin-walled, relatively rigid structures, said liner having a general configuration like that of said shell, said liner being spaced a predetermined



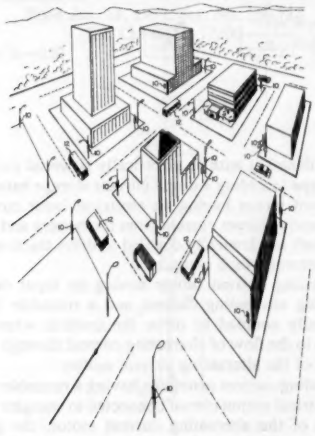
distance from said shell, and support means extending generally along the periphery of one of said components to maintain the predetermined distance between said liner and said shell, said liner and shell being substantially free of support between one another inwardly of the periphery of said one component.

4,099,591

VEHICLE CONTROL SCANNING SYSTEM

Frank J. Carr, Annapolis, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 2, 1976, Ser. No. 720,026
Int. Cl.[2] G08G 1/12
U.S. Cl. 180—98 9 Claims



1. A vehicle control scanning system comprising:

(a) a network of reflective target members disposed along the expected path of said vehicle and on both sides of said path;

(b) vehicle carried optical scanning means for generating scanning optical beams for scanning said target members on both sides of said path during travel of said vehicle;

(c) said scanning means including

(i) a light source for providing a single optical beam;

(ii) a rotating mirror having a plurality of facets;

(iii) a mirror system interposed in the path of said optical beam and being constructed and arranged to reflect said beam simultaneously to two different facets of said rotating mirror to provide two simultaneously scanning beams; and

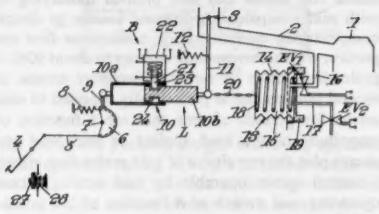
(d) vehicle carried detection means positioned for detecting the reflected optical beams from said both sides.

4,099,592

SPEED LIMITER DEVICES FOR AUTOMOBILES

Boris Gonzales, Issy-les-Moulineaux, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Jul. 12, 1976, Ser. No. 704,757
Claims priority, application France, Jul. 23, 1975, 75 23038; Feb. 18, 1976, 76 04452
Int. Cl.[2] B60K 31/00
U.S. Cl. 180—108 38 Claims



1. Speed limiter device for an automobile vehicle having a combustion engine comprising an air intake manifold provided with a throttle member, manual control means of the accelerator pedal type to act on the opening of the throttle member and connecting means between these opening control means and the throttle member, this limiter device comprising an assembly of:

means sensitive to a speed parameter of the vehicle, which sensitive means are adapted to produce a speed signal, comparator means provided to compare this signal with a predetermined limit,

and amplifier means for the signal supplied by the comparator means, these amplifiers means being adapted to control the actuation of drive means sensitive to the suction in the intake manifold, these drive means acting on the opening of the throttle member so as to keep the value of the speed parameter of the vehicle at the predetermined limit when the limiter device is engaged, said connecting means between the opening control means and the throttle member being arranged so as to have a substantially constant length when the limiter device is not engaged and to have a variable length when the limiter device is engaged, said limiter device comprising a device forming a resistant point for the stroke end of the manual control means, said resistant point device being adapted to be overcome by the manual control means on exerting a sufficient force on the control means, electrical contact means being also provided to be actuated by the manual control means when said resistant point is overcome, said electrical contact means being adapted to actuate the maximum opening of the throttle member, the assembly being such that when the limiter device is engaged, the driver of the vehicle maintains the manual control at the stroke end in abutment against the resistant point device and, in the course of limitation, the overcoming of this resistant point enables the limitation to be overcome and the maximum opening of the throttle member and thus the maximum engine power, to be obtained.

4,099,593

AUTOMOBILE LOCK MECHANISM

Norman W. Schultz, 3834 W. 118th St., Hawthorne, Calif. 90250

Filed Jun. 14, 1976, Ser. No. 695,770
Int. Cl.[2] B60R 25/00
U.S. Cl. 180—114 18 Claims

1. A safe compartment for usage with a locking apparatus for a vehicle comprising:

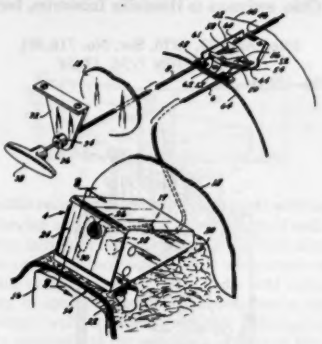
an outer shell of heavy gauge metal;

an inner shell of heavy gauge metal positioned within said outer shell;

said inner shell providing a panel for switch means to be positioned within the safe compartment;

a door for the safe compartment which is movable to a closed position;

means associated with the door to move the switch means to an inactive position toward said panel upon movement of the door to its closed position;



said means associated with the door including a locking cam secured to said door, and

a slot in said inner shell to receive the locking cam with the door in its closed position,

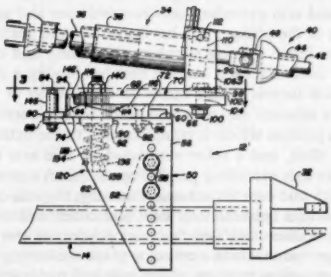
said locking cam having a position and a configuration to move the switch means to an inactive position toward said panel on movement of the door to its closed position.

4,099,594

TONGUE-MOUNTED ASSEMBLY FOR SUPPORTING AN IMPLEMENT DRIVELINE

Kenneth E. Smith, Strasburg, and Floyd L. Myer, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Sep. 8, 1976, Ser. No. 721,270
Int. Cl.[2] F16D *3/00*
U.S. Cl. 180—14 B **4 Claims**



1. An improved assembly mounted on a tongue of a draft implement having an input driveline, said assembly normally supporting said driveline in a predetermined longitudinally extending position for operative drive connection with a power shaft of a tractor or the like which tows the implement through an articulation connection with the implement tongue, said assembly comprising:

support means on the implement tongue;

a lower jaw part fixedly mounted on said support means;

an upper jaw part;

shaft means extending generally vertically through said lower jaw part and journalling said upper jaw part for rotation relative to said lower jaw part about a generally upright axis and for concurrent axial sliding movement toward and away from an intermeshed relationship with said lower jaw part;

each of said jaw parts includes a plurality of teeth extending radially from said upright axis defined by said shaft means and projecting outwardly, the teeth on said upper jaw part extending toward and interengaged with the teeth on said lower jaw part when said jaw parts are disposed in said intermeshed relationship;

a generally horizontal arm rigidly connected to said upper jaw part for movement therewith and being interconnected to and supporting said driveline; and

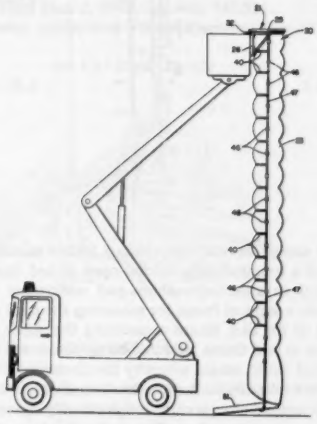
resilient means for urging said upper jaw part downwardly toward said lower jaw part so as to normally maintain the teeth of said upper jaw part in the intermeshed relationship with the teeth of said lower jaw part such that said arm will support said driveline in said predetermined longitudinal position, said resilient means being yieldable to allow said upper jaw part to concurrently rotate relative to, and axially slide away from said intermeshed relationship upon said lower jaw part between predetermined angularly displaced limits such that said arm will pivotally move laterally and allow lateral movement of said driveline therewith to accommodate sharp turns of the tractor relative to the implement; said predetermined angularly displaced limits between which said upper jaw part may rotate relative to said lower jaw part are defined by a pair of angularly spaced apart elements projecting from said upper jaw part and a stop element stationarily mounted adjacent said lower jaw part spaced between and in the path of movement of said projecting elements with said upper jaw part so as to preclude said teeth on said upper jaw part from indexing into a new intermeshing relationship relative to said teeth on said lower jaw part when said upper jaw part is rotated.

4,099,595

ESCAPE DEVICE

Thomas Ray Tracy, 2175 Fairmeadow Dr., Boise, Id. 83704

Filed Apr. 20, 1976, Ser. No. 678,641
Int. Cl.[2] A62B *1/20*
U.S. Cl. 182—48 **6 Claims**



1. An escape chute adapted for rescuing persons from multi-storied buildings in event normal egress paths are blocked comprising a generally cylindrical tube of high strength plastic material of multi-story length of a diameter sufficient to freely receive persons entering one end feet first, said peripheral wall at one end of the chute being annularly reinforced at closely longitudinally spaced intervals by nonyielding, tear resisting, reinforcing bands adapted, upon return folding of said one end outwardly around a rigid annulus support member, to dispose

said reinforcing bands into face butting engagement; annularly spaced securing grommets entered through said reinforcing bands and the intervening layers of said plastic material to fixedly secure said chute to said annulus; and respective semicylindrical resilient bands end connected to said tube of plastic material at respective diametrically opposed longitudinally spaced and aligned points, said resilient bands being of a substantially lesser length than the diameter of said fully open tube at said spaced and aligned points whereby the peripherally encircled areas at said spaced and aligned points will be inwardly restricted to yieldingly encompass the opposing portion of a freely descending person within said chute and decelerate or brake the speed of descent, means whereby the end of said escape chute remote from said one end secured to said annulus is fitted with annularly spaced strap hooks disposed in longitudinal alignment with the said restricted peripherally encircled areas; an elongated mattress-like cushion having connector straps extending from one end adapted to be normally secured to said strap hooks thereby connecting said mattress-like cushion in end-to-end spanning relation within said remote chute end of said chute; and means adapted to releasably secure said mattress-like cushion in supporting relation to said remote chute end upon endwise interfolding of said chute toward said one end to form a chute pack for storage when assembled on a rigid annulus support member.

4,099,596

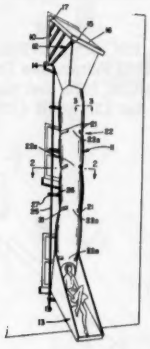
ESCAPE DEVICE

Thomas Ray Tracy, 2175 Fairmeadow Dr., Boise, Id. 83702

Continuation-in-part of Ser. No. 678,641, Apr. 20, 1976. This application Jul. 8, 1976, Ser. No. 703,706

Int. Cl.[2] A62B *1/20*

U.S. Cl. 182—48 **3 Claims**



1. An escape device comprising a folded annular pack consisting of a longitudinally folded open ended flexible tubular chute and an attached cushion pad maintained in assembly therewith, a support frame for mounting the pack at a building opening or the like, means connecting the upper open end of the chute to said frame, said pad being connected to the lower end of said chute, means whereby the chute may be released to unfold downwardly so that the lower end of said chute may be lowered toward the ground, longitudinally spaced elastic restriction means spaced at diferent levels along the unfolded chute for periodically successively slowing the descent of a body entering the upper end of said chute, each of said restriction means comprising at least two circumferentially separate elastic bands secured externally on the chute with their opposite ends in spaced relation to thereby define between said opposite ends smooth, uninterrupted areas in said chute which effectively prevent catching or snagging of a user's extremities such as elbows and heels in the area of said restriction means as the user falls through said chute and means whereby said pad is disposed angularly relative to the chute axis across and extending away from the open lower end of said chute in the unfolded position of the pack.

4,099,597

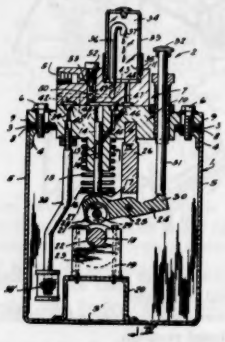
LUBRICATION PUMP

John H. Powell, Twinsburg, and James J. Callahan, Mentor, both of Ohio, assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,381

Int. Cl.[2] F16N *7/36, 13/14*

U.S. Cl. 184—27 B **2 Claims**



1. In a lubricator device, the combination of a pump structure provided with a pump cylinder therein, having an open end, a plunger reciprocable therein and having a portion extending from said open end, means biasing said plunger in a direction toward said open end, said pump structure having means for supplying lubricant to the opposite end of said cylinder, and a discharge port communicating with such opposite end of the cylinder, and valve means for controlling lubricant flow to and from said cylinder, a cam shaft disposed in spaced relation to the free end of said plunger portion, with the axis of said shaft disposed normal to and intersecting the axis of said cylinder, a cam carried by said cam shaft, a cam follower arm pivotally supported for movement about an axis laterally spaced from and extending parallel to the axis of said cam shaft, said arm extending between said cam and said free end portion of the plunger and having an arcuate portion engaged with the latter, bearing members supporting said cam shaft at spaced intervals, each bearing member having a shaft-receiving notch therein which opens on the portion of the bearing member adjacent said arm, said notch having a semicylindrical bottom portion which is complemental to the external surface of said shaft, and a roller supported by said arm for rotation about an axis extending parallel to said shaft axis and engageable with said cam for actuation thereby, the axis of said roller and contacts between said cam and roller and between said arcuate surface and said free end portion of the plunger all lying approximately in a common plane containing the plunger axis, throughout rotation of said cam and reciprocation of said plunger.

4,099,598

DRAIN SYSTEM

Ralph Clinard, 710 Queens Mill Ct., Houston, Tex. 77879

Filed Jul. 26, 1976, Ser. No. 708,554

Int. Cl.[2] F16N *31/02*

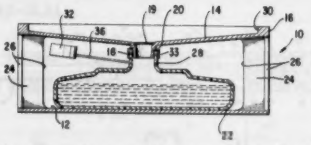
U.S. Cl. 184—106 **7 Claims**

1. A collection system for collecting spent liquid from a vehicle comprising in combination:

a substantially rigid stand adapted to be moved under a vehicle to receive spent liquid, said stand having an open top wall, an open sidewall, and a flat substantially continous bottom wall;

said bottom wall adapted to be seated on the ground and to support said stand;

said top wall inwardly sloping to an opening therein so as to receive and channel spent liquid from said vehicle through said opening, a spout integrally connected to said opening and extending downward from said opening for a predetermined distance;



a deformable receptacle operably connected with said spout for receiving said spent liquid, the bottom of said receptacle being fully supported on the bottom wall of said stand when it receives spent liquid under said vehicle as well as when the stand is removed from under said vehicle and a plurality of spaced sidewall members, firmly connecting said bottom wall to said top wall and defining a plurality of open sidewalls to permit easy removal of the deformable receptacle in both its filled and unfilled conditions.

4,099,599

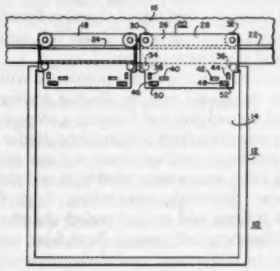
METHOD AND APPARATUS FOR FASTENING A DOOR PANEL TO A DOOR OPERATOR MOUNTED ON AN ELEVATOR CAR

Charles E. Randall, Biglerville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 1, 1977, Ser. No. 764,670

Int. Cl.[2] B66B *13/30*

U.S. Cl. 187—52 R **6 Claims**



1. An elevator system comprising:

an elevator car having an entranceway,

a door for said entranceway, said door having top, bottom and side portions, and first and second horizontally spaced hanger brackets on the top portion, said first and second hanger brackets each including an upstanding portion having first and second vertically oriented major opposed surfaces,

door operator means mounted on said elevator car having a depending hanger plate member mounted for rectilinear movement adjacent said entranceway, said hanger plate member including first and second vertically oriented major opposed surfaces, and a width dimension selected to allow the second major surface of both the first and second horizontally spaced hanger brackets to simultaneously contact the first major surface of the hanger plate member,

said hanger plate member and said first and second hanger brackets each having openings therein which extend between the associated major opposed surface,

fastener means, including horizontally oriented bolts for adjustably clamping the second major surfaces of said first and second hanger brackets to the first major surface of said hanger plate member to provide frictional area contact therebetween,

said horizontally oriented bolts of the fastener means extending between said openings in the hanger plate member and the first and second hanger brackets, which openings are aligned to accept said bolts,

said horizontally oriented bolts being carriage bolts with the openings in the first and second hanger brackets and in the hanger plate member having rectangularly shaped elongated configurations dimensioned and oriented to receive a carriage bolt and prevent it from turning, with the directions of elongation of said openings being perpendicular to one another and oriented to permit both horizontal and vertical adjustment of the first and second hanger brackets relative to the hanger plate member,

and first and second vertically oriented jacking bolts adjustably linking the first and second hanger plate members and the hanger bracket, respectively, said first and second jacking bolts cooperating with the fastener means and the frictional area contact between said first and second hanger brackets and said hanger member in supporting the weight of the door,

said fastener means being adjustable to provide a first predetermined clamping force which permits slidable orientation of said door and said first and second hanger brackets relative to said hanger plate member and said entranceway by actuation of said first and second jacking bolts, said fastener means being further adjustable to provide a predetermined second clamping force, greater than the first, which maintains the selected orientation of said door while adding structural stiffness across the top portion of said door.

4,099,600

DISC BRAKE ASSEMBLY

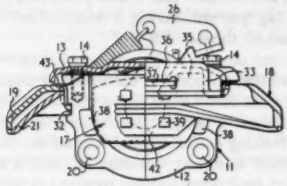
Harry Davison Temperley, and David Parsons, both of Leamington Spa, England, assignors to Automotive Products Limited, Leamington Spa, England

Filed Dec. 3, 1976, Ser. No. 747,306

Claims priority, application United Kingdom, Dec. 11, 1975, 50789/75

Int. Cl.[2] F16D *55/224*

U.S. Cl. 188—73.4 **7 Claims**



1. A disc brake assembly comprising:

(a) A rotatable disc;

a pair of brake pads, each having a friction surface thereon for frictional contact with the brake disc, disposed one on each side of the disc;

an actuator, on one side of the disc, operatively connected to one of said brake pads to apply said one brake pad to the disc by a direct thrust;

and a yoke, of closed loop form, which encircles the brake pads and a cord of the disc, operatively connected to the actuator to apply the other of said brake pads to the disc, the yoke comprising two sheet metal pressings which are joined to form hollow closed box-sections providing cross-sections through the yoke in the form of two continuous loops of pressing metal where the

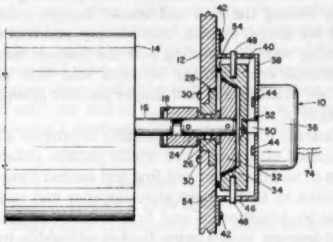
yoke passes through the planes of the pad friction surfaces.

4,099,601

SOLENOID OPERATED CONE BRAKE

John B. Pittman, Tulsa, Okla., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Continuation of Ser. No. 731,107, Oct. 8, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 840,975
Int. Cl.[2] F16D 55/02
U.S. Cl. 188—163 2 Claims



1. An electrically actuated brake for controlling a shaft mounted roll of recording medium, comprising:

a wall having a bearing therein, the bearing receiving and rotatably supporting said shaft extending from the roll and through the bearing;

a brake first portion in the form of a disc having a truncated conical braking surface theron, the brake first portion being coaxially received on said shaft on the side of said wall opposite said roll;

a bracket mounted on said wall on the side opposite said roll, the bracket being parallel said wall and of length greater than the diameter of said brake first portion, and having an opening therein coaxial with said brake first portion, the bracket having integral opposed leg portion extending to said wall and to either side of said brake first portion, each bracket leg portion having a longitudinal slot therein perpendicular to said wall;

a brake second portion positioned between said bracket and said brake first portion and between said bracket legs and having on the forward surface a recess therein defining a frustro-conical braking surface matching said brake first portion braking surface and having on the rearward surface a shaft exending coaxially of said frustro-conical recess, the shaft being slidably received in said opening in said bracket, the brake second portion having a pair of opposed radially extending pins, each pin being slidably received in a said slot in a said bracket leg portion whereby said brake second portion is displaceable axially towards and away from said brake first portion but is non-rotatable; and

a solenoid affixed to said bracket on the side thereof opposite said brake first portion, said solenoid receiving said shaft and arranged to axially displace said shaft to thereby move said brake second portion towards said brake first portion whereby the braking surfaces of each such components engage each other to stop the rotation of said roll or to move said brake second portion away from said brake first portion to permit the free rotation of said roll; and

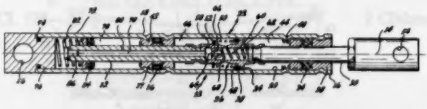
spring means urging said brake second portion away from said brake first portion.

4,099,602

HYDRAULIC POSITIONER WITH BIDIRECTIONAL DETENTING ACTION

John Kourbetsos, Woodland Hills, Calif., assignor to P. L. Porter Company, Woodland Hills, Calif.

Filed Aug. 31, 1977, Ser. No. 829,473
Int. Cl.[2] F16F 9/20
U.S. Cl. 188—300 6 Claims



1. An hydraulic positioner of the type in which a piston is movable within a fluid-filled cylinder, for adjustment to a given separation between its attachment points and for thereafter maintaining the given separation, having a bidirectional detenting action whereby the given separation can be altered only by application of a sufficiently large overriding force, said hydraulic positioner comprising:

a cylinder, hollow and having a central axis, open at its first and second ends, and having an inwardly-facing bore surface;

piston means, slidable axially within said cylinder, having a first side facing in a first axial direction and having a second side facing in a second axial direction opposite the first axial direction, and having a peripheral portion adjacent the bore surface of said cylinder but spaced from it;

a first rod attached to the first side of said piston means and extending in said first axial direction;

a second rod attached to the second side of said piston means and extending in said second axial direction;

first stationary sealing means positioned in said cylinder near its first end, in slidable sealing engagement with said first rod and forming a first sealed chamber for containing fluid within said cylindrical between said first stationary sealing means and said piston means;

second stationary sealing means positioned within said cylinder near its second end, in slidable sealing engagement with said second rod and forming a second sealed chamber for containing fluid within said cylinder between said second stationary sealing means and said piston means;

first check valve means associated with said piston means for movement therewith, preventing fluid from passing through it from said second sealed chamber to said first sealed chamber, and passing fluid from said first sealed chamber to said second sealed chamber when a force in excess of a predetermined force is applied to said piston means in said first direction;

second check valve means associated with said piston means for movement therewith, preventing fluid from passing through it from said first sealed chamber to said second sealed chamber, and passing fluid from said second sealed chamber to said first sealed chamber when a force in excess of a predetermined force is applied to said piston means in said second direction;

a reservoir for fluid, including a closed chamber extending in the second direction beyond the second end of said cylinder; and,

means for pressurizing fluid in said reservoir;

said second rod extending through said second stationary sealing means and beyond the end of said cylinder into said reservoir, said second rod further comprising an internal passage extending through it between two ports spaced sufficiently far apart in the axial direction to permit communication of pressurized fluid through said second rod from said reservoir to said second sealed chamber so that said second sealed chamber is pressurized at a small positive pressure and so that pressurized fluid is supplied

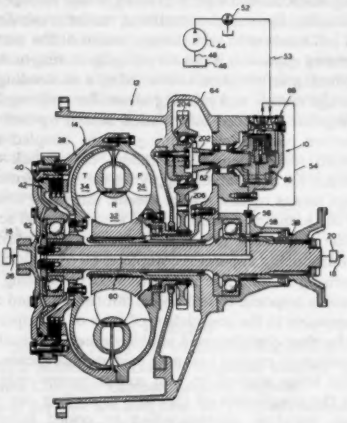
from said reservoir to said second sealed chamber to replace leakage.

4,099,603

LOCK-UP CLUTCH CONTROL VALVES

Jon H. Peppel, Horton, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 3, 1977, Ser. No. 773,868
Int. Cl.[2] F16H *45/02*
U.S. Cl. 192—3.31 **13 Claims**



1. In a vehicle drive system including a torque converter for coupling a prime mover with a transmission, a hydraulically actuated lock-up clutch arranged to selectively bypass said torque converter, and mechanically couple said prime mover directly with said transmission, a lock-up clutch control valve assembly for varying the degree of engagement of said lock-up clutch with respect to prime mover rotational speed within a predetermined speed range, said control valve assembly including:

a source of regulated fluid under pressure;

a centrifugal valve for selectively communicating said source with said lock-up clutch and with a fluid drain; and

constriction means fluidically interconnected with and located downstream from said centrifugal valve;

said centrifugal valve comprising:

a. a stationary housing and cover defining a first cavity;

b. a rotor rotatably journalled within said first cavity and drivably interconnected with said prime mover, said rotor including a radial bore having a peripheral groove connected with said source via a rotor inlet conduit;

c. a rotor spool slidably received within said radial bore and radially outwardly displaceable by centrifugal force that is a function of the rotational speed of said prime mover;

d. bias means for inwardly biasing said rotor spool in opposition to said centrifugal force;

e. a rotor outlet conduit;

f. valve means for regulating the flow of pressurized fluid from said rotor groove into said rotor outlet conduit; and

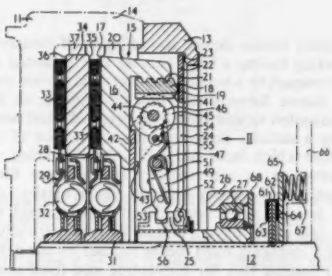
g. said rotor spool further including both a reaction member within said rotor spool, relatively movable to one another, and a spool cavity that is in constant communication with said rotor groove and said reaction member, with the resultant reaction on said rotor spool augmenting the force of said bias means whereby when said prime mover reaches a first predetermined speed said control valve assembly starts a gradual engagement of said lock-up clutch which progressively increases until said prime mover attains a second higher predetermined speed at which point said lock-up clutch is fully engaged.

4,099,604

FRICTION CLUTCH WITH INTEGRAL ADJUSTER

Raymond Higgerson, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Mar. 22, 1977, Ser. No. 780,120
Claims priority, application United Kingdom, Mar. 24, 1976, 11764/76
Int. Cl.[2] F16D *13/75*
U.S. Cl. 192—111 A **8 Claims**



1. A friction clutch comprising:

a clutch cover for attachment to a flywheel, said flywheel having a friction surface;

a pressure plate having a friction surface and comprising two relatively adjustable components;

a driven plate member arranged between the pressure plate and the flywheel and having friction surfaces for co-operation with said friction surfaces of the flywheel and the pressure plate;

a main spring assembly operatively engaged between said cover and said pressure plate for providing a clamp load to urge the pressure plate towards the flywheel and thereby grip the driven plate by its friction surfaces between the friction surfaces of the flywheel and pressure plate;

a release mechanism for relieving the clamp load;

an adjustable inter-engagement mechanism between the two pressure plate components such that a constant inter-engagement subject to incremental adjustments is achieved between the pressure plate components;

an adjuster mechanism connected between the two components of the pressure plate and operative to adjust the pressure plate to compensate for variations due to wear of the driven plate to achieve a constant clamping condition of the main spring while the clutch remains in a desired state of adjustment;

and a control member, responsive to movement between the released and engaged conditions of the clutch and operative to effect an incremental adjustment of the inter-engagement mechanism when said movement exceeds a pre-determined distance.

4,099,605

CLUTCH RELEASE DEVICE

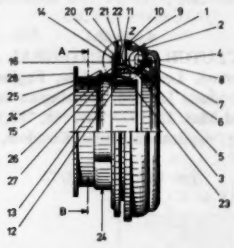
Horst Manfred Ernst, Eltingshausen; Armin Olschewski, Schweinfurt; Rainer Schürger, Schwanfeld; Lothar Walter, Schweinfurt; Manfred Brandenstein, Aschfeld, and Erich Burkl, Stammheim, all of Fed. Rep. of Germany, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Filed Oct. 4, 1976, Ser. No. 728,941

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 7534422[U]

Int. Cl.[2] F16D *19/00, 11/00, 13/60*

U.S. Cl. 192—98 9 Claims



1. A clutch release device including a self-centering clutch thrust bearing having a fixed bearing ring mounted for radial play with respect to a bearing support, said device comprising a sliding sleeve forming said bearing support, an additional sleeve connected to said sliding sleeve, said fixed bearing ring contacting a radially extending contact surface of said additional sleeve which faces said clutch thrust bearing, said additional sleeve, at an area radially spaced from the area of contact with said contact surface, being axially offset in a direction toward said clutch thrust bearing, said additional sleeve, in said offset, having at least two diametrically opposed recesses for engaging fixed means located on the periphery of said fixed bearing ring for preventing said fixed bearing ring from rotation with respect to said additional sleeve and bearing sleeve.

4,099,606

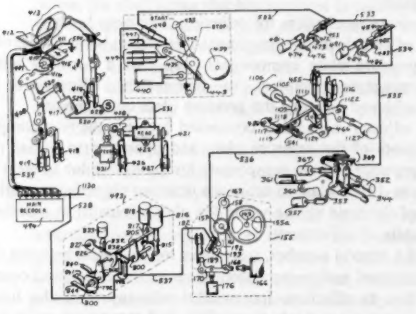
JUSTIFYING TEXT WRITING REPRODUCING MACHINE

William S. Gubelmann, deceased, late of Palm Beach, Fla. (by Walter S. Gubelmann, executor), and William R. Grier, New Vernon, N.J., assignors to Realty & Industrial Corporation, Morristown, N.J.

Division of Ser. No. 212,895, Dec. 28, 1971, Pat. No. 3,945,480. This application Dec. 16, 1975, Ser. No. 641,363

Int. Cl.[2] B41J *5/36*

U.S. Cl. 400—4 10 Claims



1. A combined simultaneously operable composing apparatus and reproducing apparatus and a common code storage means, said composing apparatus including storing means for storing blocks of encoded text reproducing information in said common code storage mens and deleting means for selectively deleting said stored text reproducing information, each block containing coded information relates to operational functions including individual items of text to be reproduced in a separate line in said reproducing apparatus, said composing apparatus further including means for altering the character of a porton of said storage means at a sensing station upon completion of storage of one of said blocks in said storge means, said block being stored in said altered portion of said storage means, said reproducing apparatus comprising reader meansfor sensing coded information in said storage means at the same time said composing apparatus is uninterruptedly storing or deleting text reproducing information contained in a succeeding block in said storage means, and printing means for printing lines of print in response to coded information sensed by said reader means, further comprising scanning means coupled to said reader means for sequentially scanning each block of said storage means for sequentially applying coded information in said storage means to said reader means; inhibiting means for inhibiting the scanning of said storage means by said scanning means while said reader means senses said coded information and said reproducing apparatus completes an operational function comprising at least one instruction corresponding to one of said items in response to said coded information; and cycling means responsive to the completion of each of said operational functions for then disabling said inhibiting means to enable said scanning means to resume scanning said storage means, coded information being applied to said reader means only in response to the completion of the next preceding one of said operational functions corresponding to coded information previously applied to said reader means, said reproducing apparatus being operable at a given time only in response to coded information in a block preceding a block in which said composing apparatus is storing information at said given time, and control means responsive to the altered character of said portion of said storage means at said sensing station for enabling the operation of said reader means, said control means disabling said reader means in response to the absence of an altered character portion of said storage means at said sensing station.

4,099,607

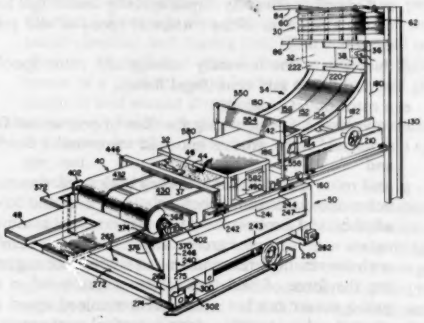
APERTURE MASK CONVEYOR AND INSPECTION SYSTEM

Leon E. Brennan; Joseph P. Lagermasini, both of Towanda, and Larry L. Rarig, Lancaster, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 4, 1977, Ser. No. 765,772

Int. Cl.[2] B65G *43/08, 21/10, 15/14*

U.S. Cl. 198—341 12 Claims



1. An aperture mask conveyor and inspection system for

feeding the mask to a densitometer to check the amount of light transmission at the center portion of the mask, said system comprising:

(a) a first conveyor means comprising a pair of parallel belt conveyors which grip the mask therebetween, said means for receiving and transporting a vertically disposed aperture mask having one of its axes extending horizontally, said mask traveling in the direction of said axis,

(b) chute means positioned beneath the first conveyor means and at right angles to the line of travel of the aperture mask,

(c) means for moving one of the pair of belt conveyors away from the other so that the mask normally griped therebetween will fall freely upon the chute means,

(d) means for sensing the travel of the mask whereby when said mask is aligned with the chute the conveyor will release the mask so that the mask will move downwardly onto the chute in the direction of the other axis of said mask,

(e) second conveyor means positioned at the lower extremity of the chute to transport the mask in the same direction as in the chute, and

(f) a densitometer centrally positioned with respect to the width of the second conveyor means whereby the densitometer will scan the middle of the mask along its other axis.

4,099,608

APPARATUS FOR FEEDING ARTICLES

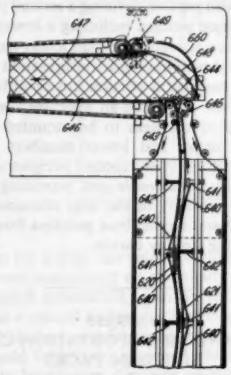
Alan Keith McCombie, London, England, assignor to Molins Machine Company Limited, London, England

Division of Ser. No. 234,833, Mar. 15, 1972, abandoned, which is a continuation of Ser. No. 875,402, Nov. 10, 1969, abandoned. This application Jul. 21, 1975, Ser. No. 597,431

Claims priority, application United Kingdom, Nov. 14, 1968, 54034/68; Feb. 14, 1969, 8313/69; Feb. 28, 1969, 10941/69; Jan. 24, 1969, 4195/69; Jan. 24, 1969, 4196/69

Int. Cl.[2] B65G *43/08*

U.S. Cl. 198—347 **13 Claims**



1. A conveyor system for delivering a row of sideways-moving cigarettes or other rod-like articles upwards into a stack comprising a first substantially horizontal conveyor for carrying a stack of the articles, means defining a junction zone at one end of said first conveyor, and a second sustantially horizontal conveyor having one end adjacent to the junction zone on the side thereof opposite the first conveyor, and an elevator comprising two spaced parallel bands, means for maintaining the bands in tension, means for individually constraining the bands to move upward along a path which is non-linear substantially throughout the upwardly extending portion of said path whereby the bands grip articles between them and drive them upwards to enter said junction zone at a point below the upper surface of the articles in the junction zone in a generally upward direction between the two conveyors, and sensor means responsive to the articles in the junction zone for controlling the movement of one of the said conveyors.

4,099,609

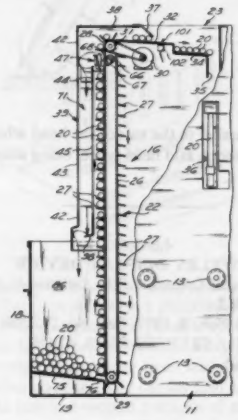
BOBBIN ELEVATING CONVEYOR AND ORIENTOR

John P. Kieronski, Charlotte; Francis N. Williams, Gastonia, and Leo J. Smith, Charlotte, all of N.C., assignors to Whitin Machine Works, Inc., Charlotte, N.C.

Filed Sep. 26, 1975, Ser. No. 617,064

Int. Cl.[2] B65G *43/08*

U.S. Cl. 198—395 **8 Claims**



1. A mechanism for sorting head and butt ends of a succession of bobbins, comprising means for conveying bobbins along a path in spaced parallel relation to one another and transversely aligned to the conveying direction, mechanical sensor means at one side of the bobbin path, said sensor means being arranged relative to the bobbin conveyor path to be displaced in the axial direction of the bobbins by the adjacent butt ends of the bobbins and arranged to avoid being displaced by the adjacent head ends of the bobbins, means responsive to displacement of said sensor means to reject bobbins of one head or butt orientation from the conveying means.

4,099,610

ENDLESS POWER-DRIVEN CONVEYOR WITH DISCHARGE COMB

Marc M. Aubailly-Delalieu, Nice, France, assignor to Societe Anonyme Eau-Gaz-Assainissement, Nice, France

Filed Feb. 9, 1976, Ser. No. 656,261

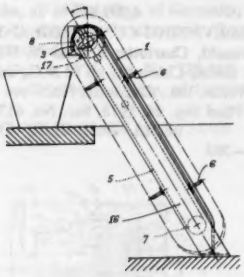
Claims priority, application France, Feb. 7, 1975, 75 04422

Int. Cl.[2] B65G *19/00*

U.S. Cl. 198—729 **1 Claim**

1. In an upwardly extending power-drive conveyor having a head wheel and an endless conveyor member passing about the head wheel and rake teeth on the endless member, there being a plurality of parallel comb elements extending between the rake teeth; the improvement in which the comb elements rest directly on the head wheel, the periphery of said head wheel having a plurality of spaced parallel annular recesses extending about the periphery thereof, the upper ends of said comb elements being disposed in said recesses, a drive shaft on which said head wheel is fixedly mounted, said endless conveyor comprising a pair of chains one disposed on either side of said head wheel, toothed wheels fixed to said shaft one on either end of said head wheel, said toothed wheels being in driving engagement with said chains, and a plurality of crosspieces extending between and interconnecting said chains, said rake teeth extending outwardly from said crosspieces between said

comb elements, said crosspieces passing beneath said comb elements along the upper run of said conveyor, said head wheel having at least one recess therein extending the length of



the head wheel parallel to the axis of the head wheel for reception of said crosspieces, said head wheel being also fixed to said shaft.

4,099,611

JEWELRY DISPLAY DEVICE

Jeffrey A. Feibelman, Cranston, R.I., assignor to A. & H. Mfg. Co., Cranston, R.I.

Filed Nov. 8, 1976, Ser. No. 742,530

Int. Cl.[2] B65D *85/56, 85/58*

U.S. Cl. 206—45.14 **11 Claims**

1. A display device for use in the display of jewelry articles and the like comprising, in combination, a display insert adapted to receive an article to be displayed and a support for releasably mounting said display insert, said support including a substantially planar panel, said panel being provided with an opening, said opening delineated in part by a pair of panel webs terminating in relatively straight edges in opposed spaced relationship to each other, said webs forming a seat for receipt of said insert, said insert having a front face including means for receiving said articles and a rear face including a pair of spaced generally parallel longitudinally oriented ribs outwardly rearwardly extending therefrom, said insert adapted for receipt within said opening and having portions transversely extending beyond said ribs for face to face contact with said seat, each of said ribs contacting a respective web edge to releasably secure said insert over said opening, said device further including a recess formed within the front surface of said panel wherein said opening is formed within said recess, said recess having a perimetrical configuration and extent corresponding to but slightly larger than that of said display insert and wherein the outer extent of said insert substantially contacts the periphery of said recess, said webs in opposed parallel relationship and inwardly extending from the periphery of said recess, said insert being releasably secured within said recess, and wherein the terminal portions of said ribs extend rearwardly past said web edges.

4,099,612

DISPLAY CARTON FOR LAMP FIXTURES

Wallace E. Hanson, Hampden, Mass., assignor to Champion International Corporation, Stamford, Conn.

Filed Jun. 1, 1976, Ser. No. 691,377

Int. Cl.[2] B65D *5/32*

U.S. Cl. 206—45.19 **9 Claims**

1. A display carton formed from two paperboard blanks comprising:

(a) an upper member including a first base portion and upstanding wall portion defining a first peripheral wall, said first base portion including an upper surface and an inside surface spaced from said upper surface and adapted to bear against one end of the item to be mounted in the display carton; and

(b) a lower member including a second base portion and upstanding wall portion defining a second peripheral wall, said second base portion including a lower surface and a support surface spaced from said lower surface, said second peripheral wall having a configuration corresponding to said first peripheral portion but of different size, said support surface including an aperture for receiving the opposite end of the item to be mounted in the display carton, said upper and lower members slidably intermeshed with the first and second peripheral wall portions being partially coextensive and providing an open window for the visibility of the item contained therein, and with the first and second base portions forming the opposite ends of the display carton.

4,099,613

DISPLAY AND TRANSPORTATION CASE FOR UNIFORM PACKS

Ehrhard T. Holtorf, Dudenhofen, Germany, assignor to Ferrero GmbH, Frankfurt am Main, Germany

Filed Nov. 21, 1975, Ser. No. 634,105

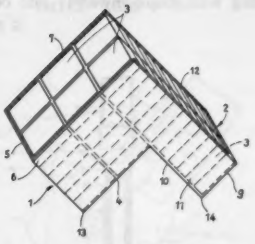
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1974, 7438874[U]

Int. Cl.[2] B65D *65/16*

U.S. Cl. 206—45.34 **17 Claims**

1. A display and transportation container for a plurality of uniform wafer packs (3) each having a solid rectangular configuration, characterized in that the container is L-shaped and comprises two contiguous sections (1, 2) disposed at right angles to one another and designed to hold the packs in a plurality of adjacent stacks, in that the bottom wall (4) of the first section is disposed at a right angle to the rear wall (10) of the second section, in that the fold (13) between the bottom

wall (4) and the front wall (5) of the first section and the fold (14) between the rear wall (10) and the bottom wall (9) of the second section are parallel to each other and serve as bearing edges in the display position, in that the upper ends of the two sections and the front side of the second section are fully open to implement complete access to the entire areas thereof, in



that the interior of the container is fully open to implement the unhindered stacking of the packs, and in that for transportation purposes, two containers can be placed together in a symmetrical, mating manner to form a rectangle, and whereby the packs may be removed from the top of the stacks when in said display position.

4,099,614

PACKAGE FOR A STERILIZED PAIR OF GLOVES AND METHOD OF FORMING THE SAME

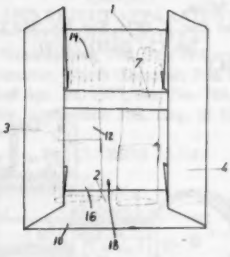
Oswald Heissenberger, Pottschach, Austria, assignor to Semperit Aktiengesellschaft, Vienna, Austria

Filed Dec. 23, 1976, Ser. No. 754,088

Claims priority, application Switzerland, Jul. 22, 1976, 9435/76

Int. Cl.² B65D *85/18*

U.S. Cl. 206—299 **13 Claims**



1. A package for at least one pair of sterilized gloves used for medical purposes comprising an essentially rectangular sheet of material folded substantially parallel to all four sides and subsequently at a central region, the improvement comprising:

an upper fold and a lower fold having edges spaced from one another, said folds being disposed essentially at right angles to the lengthwise direction of the gloves for completely covering, in contacting relation therewith, the fingers of the gloves and at least part of the cuffs of the gloves;

two lateral, uncut folds to both sides of the pair of gloves essentially parallel to the lengthwise direction of the gloves and overlying said upper and lower folds;

a further fold at the center between the edges of both said upper and lower folds and essentially at right angles to the lengthwise direction of the gloves, such that said gloves are folded at right angles to their lengthwise direction and only said lateral folds and said central region of said sheet of material are folded by said further fold; and

a final fold centrally and essentially parallel to the lengthwise direction of the folded gloves such that only said upper and lower folds and said central region of said sheet of material are folded by said final fold to thereby form a compact glove package requiring a minimum amount of sheet material.

4,099,615

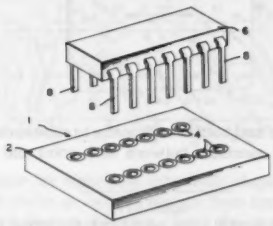
CARRIER STRIP MOUNTED ELECTRICAL COMPONENTS

Timothy Allen Lemke, Dillsburg, and Edmond Franklin Shultz, Jr., Hummelstown, both of Pa., assignors to AMP, Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 499,719, Aug. 22, 1974, abandoned. This application Feb. 26, 1976, Ser. No. 661,678

Int. Cl.² B65D *73/02*

U.S. Cl. 206—329 **4 Claims**



1. An assembly of electrical components, comprising:

a carrier film provided with a plurality of spaced apertures,

a plurality of electrical components received in said apertures and having solder wettable body portions projecting in depending relationship from said carrier film,

a second film covering said carrier film and covering solder wettable first and second portions of each corresponding component,

said second film and said carrier film cooperating to form envelope means enclosing said solder wettable first and second portions,

said solder wettable body portions of corresponding components projecting externally of said envelope means,

said apertures in said carrier film defining solder admissible clearance spaces adjacent said body portions to permit solder flow along said solder wettable body portions and through said carrier film and into said envelope means and into wettable contact with said first portions of said electrical components, and

said second film contacting and covering said second portions of said electrical components within said envelope means preventing solder contact with said second portions while permitting solder contact with said first portions of said electrical components.

4,099,616

TWO-BOTTLE PACKAGE AND BAG

Julius Mindaugas Klygis, Barrington, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

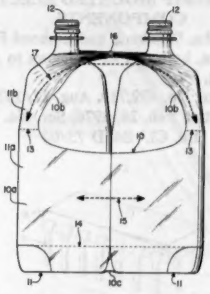
Filed Apr. 14, 1977, Ser. No. 787,420

Int. Cl.² B65D *71/00, 85/62*

U.S. Cl. 206—427 **3 Claims**

1. A package of two bottles comprising, a bag substantially enveloping two bottles in an upstanding side-by-side abutting relationship, said bag formed of a resilient elastic plastic material and comprising a band portion encircling a substantial vertical extent of the body portions of both of said bottles and substantially tensioned horizontally circumferentially about the body portions of both of said bottles, a bottom wall connected to the lower edges of at least two opposed sections of said band portion and extending beneath a substantial portion of the bottom walls of both of said bottles, a pair of upper wall portions, each of said upper wall portions comprising a bifurcated member of two strips integrally joined to a common base section, the common base section of said bifurcated members integrally connected to opposed sections of the upper edge of said band portion, the two strips of each bifurcated member

straddling the upper neck portion of one of said bottles beneath the cap portion thereof, and the two strips of both of said bifurcated members being secured together and gathered substantially to a point substantially midway between the upper



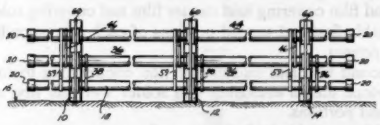
neck portions of said bottles sufficiently to substantially tension said bifurcated members between said point and said band portion.

4,099,617

SHIPPING BUNDLE FOR NUMEROUS PIPE LENGTHS

Ferdinand J. Nist, Jr., Enumclaw, Wash., assignor to Seattle Box Co., Kent, Wash.

Filed Feb. 17, 1977, Ser. No. 769,542
Int. Cl.[2] B65D *85/20*
U.S. Cl. 206—443 **7 Claims**



1. A shipping bundle formed of a plurality of lengths of pipe of a common size, comprising:

a base formed of a first plurality of transverse sleepers located in spaced-apart parallel arrangement;

a tier of pipe lengths resting on said base, adjacent pipe lengths of said tier being separated by blocks in transverse series, each block having opposed concavities substantially embracing the curved sides of said adjacent pipe lengths;

each of said series of blocks being located to stand on one of said sleepers and being of a height greater than the thickness of the tier of pipe lengths;

a second plurality of sleepers, each traversing said pipe tier in overlying alignment with a sleeper of said first plurality, the sleepers of said second plurality being supported on the series of separating blocks; and

a bundling strap tightly encircling each sleeper of said first plurality, the separating blocks resting thereon, and the respective overlying sleeper.

4,099,618

PROTECTIVE CONTAINER FOR FONT DISC SEGMENTS

Peter R. Ebner, S. Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 12, 1976, Ser. No. 675,663
Int. Cl.[2] B65D *85/48*
U.S. Cl. 206—454 **11 Claims**

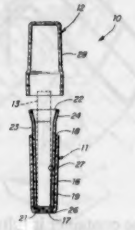
1. A protective container for delicate objects, said container comprising:

a. a housing portion for receiving an object, said housing portion including:

1. an outer casing; and,

2. an inner casing supported within said outer casing, said inner casing having projecting wall means extending through an opening in one end of said outer casing, said projecting wall means defining an opening for insertion of said object into said inner casing; and,

b. a cap portion for closing said housing portion, said cap portion including flange means for surrounding said projecting wall means of said inner casing and for forcing said projecting wall means inwardly into contact with said



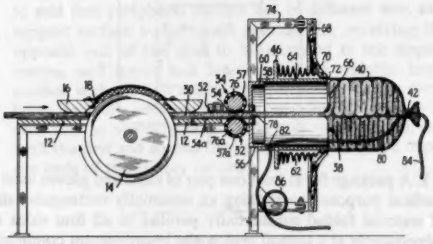
object for locking said object against movement within said container wherein said outer casing includes side walls which are normally in contact with said side walls of said inner casing, and wherein said flange means of said cap portion cooperates with said projecting wall means of said inner casing for forcing the side walls of said inner casing away from the side walls of said outer casing and against said object.

4,099,619

SORBENT BOOM WITH FLOTATION AND APPARATUS AND METHOD FOR STUFFING SAME

Charles William Hudler, Cloquet; Clare Eugene Swanson, White Bear Lake; George Holger Sundin, Duluth, and Ilmer Issac Niemi, Cloquet, all of Minn., assignors to Conwed Corporation, St. Paul, Minn.

Filed Dec. 1, 1976, Ser. No. 746,237
Int. Cl.[2] B65D *75/00*
U.S. Cl. 206—524.1 **3 Claims**



1. A floatable sorbent boom comprising:

(a) a porous flexible, tubular, mesh-like cover having a length at least 10 times its width and having first and second closed ends, said cover having openings large enough to allow substantially free passage of oil and water therethrough;

(b) at least one flexible strip of substantially oleophilic and substantially hydrophobic sorbent material within said cover;

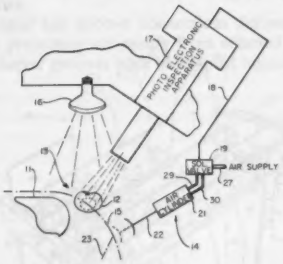
(c) said at least one strip having a length at least 10 times the length of the said cover and a minimum length of at least 10 feet, a width from about ¼ inch to substantially equal to the width of the cover and a thickness of from about 1/64 to about ½ inch; and

(d) said at least one strip being folded in pleated fashion with the pleats being transverse to the longitudinal axis of the cover.

4,099,620
REJECTOR DRIVE SYSTEM FOR SORTING APPARATUS

Robert M. Kendall, Sunnyvale, and William F. Lapson, Cupertino, both of Calif., assignors to Acurex Corporation, Mountain View, Calif.

Filed Mar. 23, 1977, Ser. No. 780,313
Int. Cl.[2] B65G 47/34
U.S. Cl. 209—74 R 5 Claims

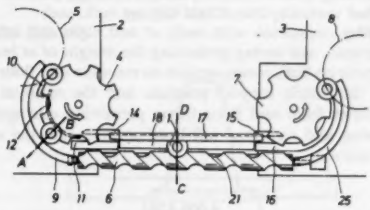


1. A rejector system for sorting apparatus including a rejector for engaging and displacing objects to be rejected including an air cylinder having a piston for driving said rejector between an advanced and retracted position, means for supplying pressurized air to said cylinder for driving said piston to advance the rejector, control means connected between said air supply means and said cylinder for selectively applying air pressure to said cylinder to cause said piston to drive said rejector, and a flow restrictor disposed in said air supply to restrict the flow of air to said cylinder after the piston is initially accelerated to limit the velocity of the piston.

4,099,621
CONVEYING AND REJECT APPARATUS FOR UPRIGHT STANDING BOTTLES

Karl Dullinger, Neutraubling, Fed. Rep. of Germany, assignor to Hermann Kronseder, Worth (Danube), Fed. Rep. of Germany

Filed Apr. 11, 1977, Ser. No. 786,532
Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2619950
Int. Cl.[2] B07B 13/04
U.S. Cl. 209—98 8 Claims

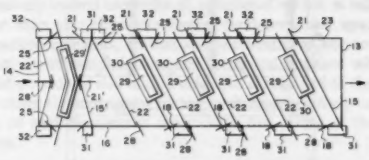


1. In apparatus for conveying upright standing bottles on a path between two synchronously driven bottle treating machines, said apparatus comprising a pocketed star wheel and a worm both driven synchronously with the bottle treating machines, and rails along said path for supporting and guiding said bottles along said path, the improvement for rejecting fractured bottles in which there are two bottle rejecting sections along said path, one of said sections comprising a guide rail along the side of the bottle body and a support rail along the bottom of the bottle and a first gap between said rails through which broken bottles and fragments thereof smaller than said first gap will fall, the other said section comprising a guide rail along the side of the bottle top and a support rail along the bottom of the bottle and a second gap between said rails through which broken bottles and fragments larger than the first gap but smaller than said second gap will fall, both said gaps being longer than the bottle diameter.

4,099,622
INCLINED CONVEYOR BELT SOLIDS SEPARATION SYSTEM

Edward D. Burger, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1976, Ser. No. 749,587
Int. Cl.[2] B07C 1/00
U.S. Cl. 209—114 47 Claims



1. A system for separating spherically-shaped solids which tend to roll down an inclined surface from irregularly-shaped solids which have a side that causes the irregularly-shaped solids to tend to slide down an inclined surface comprising:

a. a conveyor belt-like member having an upper surface, an upper end and a lower end and adapted to rotate about said upper end and said lower end in a manner such that a point on said conveyor belt-like member cycles upward around said upper end, downward around said lower end, and then upward to the point of origination, said conveyor belt-like member being inclined from horizontal along its longitudinal axis at an angle at least as great as the static roll angle of the spherically-shaped solids and less than the static slide angle of the irregularly-shaped solids;

b. first removal means adapted to deflect irregularly-shaped solids moving upward on said upper surface in an upward, sideways direction so that said irregularly-shaped solids move off a side of said conveyor belt-like member;

c. second removal means spaced along the longitudinal axis of said conveyor belt-like member from and below said first removal means, said second removal means being adapted to deflect spherically-shaped solids moving downward on said upper surface in a downward, sideways direction so that said spherically-shaped solids move off a side of said conveyor belt-like member;

d. supply means adapted to feed a mixture of said spherically-shaped solids and said irregularly-shaped solids onto a portion of said upper surface between said first removal means and said second removal means;

e. first receiving means adapted to receive irregularly-shaped solids deflected off said inclined conveyor belt-like member by said first removal means; and

f. second receiving means adapted to receive spherically-shaped solids deflected off said inclined conveyor belt-like member by said second removal means.

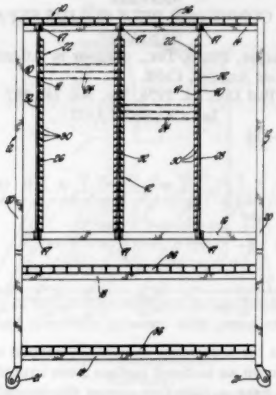
4,099,623
CIRCUIT BOARD STORAGE CART

Peter Van Osdol, Grosse Pointe Farms, Mich., assignor to Panel Controls Corporation, Detroit, Mich.

Filed Sep. 8, 1977, Ser. No. 831,360
Int. Cl.[2] A47G 19/08; A47F 5/00; H02B 1/04
U.S. Cl. 211—41 17 Claims

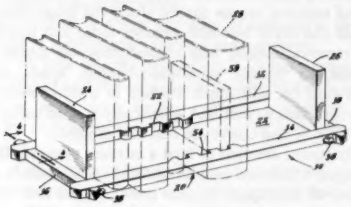
1. A circuit board storage cart assembly comprising; a frame, circuit board storage means for storing circuit boards and supported by said frame, said circuit board storage means comprising a pair of opposed channel assemblies each having a plurality of channels so that said channels are paired between said assemblies so that each pair of channels may support a circuit board, said channels having two sloping portions with

said portions sloping downwardly from the outward ends thereof to an apex at the inner ends thereof, and each of said channel assemblies including connecting means for vertically interconnecting said plurality of channels, said connecting



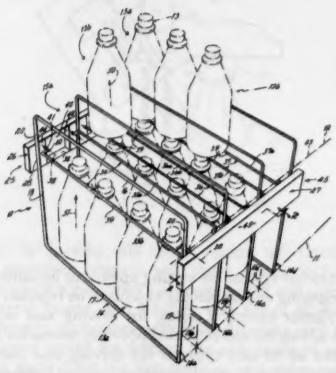
means including two outer posts adjacent to and interconnecting said outward ends of said channels of each assembly and a middle post interconnecting said plurality of channels of each assembly at said apexes.

4,099,624
PORTABLE BOOK RACK
John W. McKearin, P.O. Box. 118, Saugatuck Station, Westport, Conn. 06880
Filed May 5, 1977, Ser. No. 793,888
Int. Cl.[2] A47B *65/00*
U.S. Cl. 211—42 **11 Claims**



1. A portable book rack comprising:
a base, said base including
a pair of elongated side bars each having a surface thereof facing the other, and
a pair of cross bars, each of said cross bars connecting opposed ends of said side bars,
said side bars having an upper surface for supporting a plurality of books or like articles thereon,
a bookend pivotably connected to each of said side bars at opposite ends thereof adjacent said cross bars, at least one of said bookends being removably mounted between the side bars of said base, each of said bookends including
a surface for abutment with its adjacent cross bar when in a substantially upright position and a rounded corner adjacent said cross bar enabling said bookend to pivot to a position between said side bars substantially coplanar therewith, and
means on the facing surfaces of said side bars intermediate the ends of each side bar defining a pair of aligned, substantially upright slots for receiving therebetween a divider or one of said bookends which in conjunction with at least the other of said bookends will support one or more books therebetween.

4,099,625
DISPLAY RACK
Rafael T. Bustos, Clarkston, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Jul. 13, 1977, Ser. No. 815,224
Int. Cl.[2] A47F *5/00*
U.S. Cl. 211—49 R **18 Claims**



11. A floor frame for an upper shelf of a display rack having upper and lower shelves said display rack's upper and lower shelves each defining one row, said upper shelf row being disposed in the same vertical longitudinal plane as said lower shelf row, said floor frame comprising:
a right hand support section and a left hand support section, each support section being separably pivotable on a pivot axis disposed parallel to said row's vertical longitudinal plane, said pivot axes being disposed on opposite sides of that longitudinal plane, and said right hand and left hand support sections being movable between an article support position in which said sections are oriented in the shelf plane of said upper shelf row for supporting articles in that upper shelf row, and a storage position in which said support sections are removed from said article support position when no article is in said upper shelf row for allowing articles that may be in said lower shelf row to be lifted vertically out of said display rack, and:
a spring connected with each of said right and left hand sections, said spring permitting the weight of at least one article on both frame sections to maintain said floor frame in the article support position, and the removal of all articles from said floor frame permitting said spring to swing said right and left hand sections into the storage position.

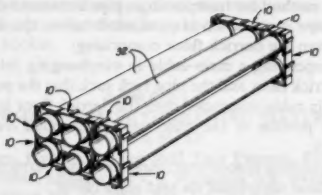
4,099,626
MODULAR RACK
Robert O. Magnussen, Jr., 20442 Lake Canyon Dr., Walnut, Calif. 91789
Filed Feb. 15, 1977, Ser. No. 768,678
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—60 R **7 Claims**

1. A modular component of a rack for storing articles, comprising
a. a longitudinally elongated body having opposite sides, a longitudinally elongated boundary, longitudinally spaced segmented boundaries laterally spaced from said longitudinally elongated bondary, and longitudinally spaced laterally extending boundaries at longitudinally opposite ends of the body,

b. the body having tongue and groove connections at certain of said boundaries, said connections defining guide shoulders extending widthwise between said opposite sides for guided connection with like tongue and groove connections on a like modular component,

c. and said body defining two through openings extending widthwise between said sides, said openings sized to receive said articles which are elongated in said widthwise direction, said through openings being longitudinally spaced between said laterally extending boundaries, and said openings located generally between said segmented boundaries.

d. said tongue and groove connections defining T-shaped tongues projecting outwardly from selected boundaries, and T-shaped grooves sunk in selected boundaries,



e. said tongues and grooves occurring in alternation sequentially along and about said boundaries,

f. four of said connections being spaced along said longitudinally elongated boundary, another four of said connections being spaced along said segmented boundaries with two of the other four connections located at the segmented boundary located between said openings, and wherein one of said connections is located at each of the boundaries at opposite ends of the body, the body longitudinal dimension being about four times as great as the body lateral overall dimension,

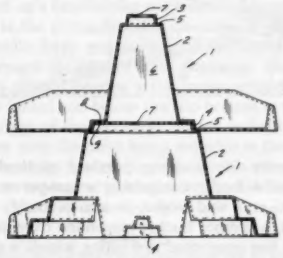
g. whereby six of said bodies may be interconnected via tongues and grooves to form six circular through openings, four of the bodies extending longitudinally horizontally, and two of the bodies extending longitudinally vertically.

4,099,627

ARRANGEMENT FOR DISPLAYING ARTICLES

Robert Strada, New York, N.Y., assignor to Robert Strada Design Associates, Inc., New York, N.Y.

Filed Sep. 21, 1976, Ser. No. 725,273
Int. Cl.[2] A47F *3/10*
U.S. Cl. 211—163 **10 Claims**



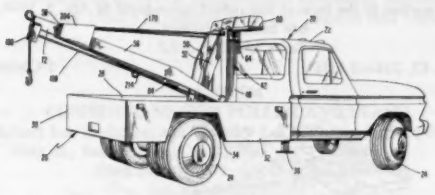
1. Arrangement for displaying articles, comprising a plurality of stackable elements, each having opposite sides; means for stacking said elements in a row, including a projection having an axis and extending lengthwise of said row beyond one of said sides of each of said elements, each projection having a free end portion which is elongated transversely of said row in a first direction and substantially coaxial with said projection, and a recess formed in the other of said sides of each of said elements substantially coaxial with said free end portion and being elongated transversely of said row in a different second direction, each recess of a respective element being operative for receiving said free end portions of a respective other element upon alignment of said respective free end portion in said second direction, and for maintaining successively stacked elements at a predetermined spacing from each other; and means for nesting said elements, including a cavity formed in said other side of each of said elements substantially coaxial with said recess and being elongated transversely of said row in said first direction, each cavity of a respective element being operative for receiving a respective projection upon insertion of the latter into said respective cavity, and for maintaining successively nested elements at a distance which is relatively smaller than the afore-mentioned predetermined spacing of said stacked elements, so that said elements can be moved by rotation about said axis between a stacked position when the free end portion of one of said elements is received in the recess of the other element, and a nested position when the projection of one of said elements is received in the cavity of the other element.

4,099,628

TOWING VEHICLE

Roy A. Richardson, Belfast, Tenn., assignor to Richardson Industries, Inc., Nashville, Tenn.

Filed Aug. 20, 1976, Ser. No. 716,245
Int. Cl.[2] B66C *23/02*
U.S. Cl. 212—65 **21 Claims**



1. A towing vehicle having a frame, and a drive train for propulsion of the vehicle along a roadway, comprising:

a turntable mounted on said frame for rotation about a vertical axis;

first means for selectively rotating said turntable about said vertical axis in either direction;

a boom assembly attached to said turntable for rotation therewith about said vertical axis, said boom assembly including an inverted, generally U-shaped main support having a horizontal member connecting the upper ends of two vertical legs fixedly attached at their lower ends to said turntable, said boom assembly further including a generally V-shaped support frame having first and second arms joined together at one end to form an apex and each pivotally attached at the other end to said turntable adjacent a respective vertical leg of said U-shaped main support for pivotal movement about a horizontal axis, said V-shaped support frame including a support cable between the upper end of said U-shaped main support and the apex of said V-shaped support frame to maintain said V-shaped support frame in a preselected angular position relative to said U-shaped main frame and said turntable;

a telescoping boom mounted to said V-shaped support frame;

a second means on said V-shaped support frame for selectively extending and retracting said telescoping boom;

a cable winch;

and a cable pulley disposed on the distal end of said telescoping boom, said pulley being rotatable about a horizontal axis parallel to said horizontal axis of rotation of said V-shaped frame, the cable from said winch passing along

the underside of said V-shaped frame, and over said pulley;

said first and second means and said winch being operable independently of the vehicle drive train;

control means coupled to said first and second means and said winch for controlling said rotatable turntable, said telescoping boom and said cable winch from positions remote from said vehicle, and

support cable adjustment means on said V-shaped support frame for adjusting the angular position of said V-shaped support frame with respect to said U-shaped main support, said adjustment means comprising a carriage attached to said V-shaped support frame, a slider disposed on said carriage for movement toward and away from said apex, a pair of pulleys on the distal end of said V-shaped support frame, and means cooperating with said carriage for maintaining said slider in a preselected position, said support cable being attached at one end to said U-shaped main support, passing around one of said pulleys, around said slider, around the other of said pulleys, and back to said U-shaped main support where it is attached at its other end, whereby movement of said slider results in lengthening or shortening of the cable between the distal end of said V-shaped support frame and said U-shaped main support thereby to adjust the angle therebetween.

4,099,629

HAY BALE HANDLING MACHINE

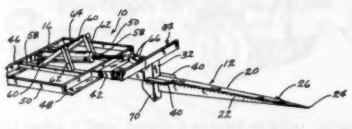
Randal A. Cox, R.R. 1, Van Wert, Iowa 50262

Continuation of Ser. No. 517,434, Oct. 23, 1974, Pat. No. 4,015,739. This application Apr. 4, 1977, Ser. No. 784,396

The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.

Int. Cl.[2] E02F *3/62*

U.S. Cl. 214—1 HH **1 Claim**



1. A pickup truck mounted round bale handling machine for loading round bales and transporting them in a substantially upright position comprising,

a pickup truck having a frame and a cab and a rearwardly disposed box on said frame including opposite sidewalls, a front end wall, a bed, and an open rear end,

a round bale hay handling machine positioned in the rear open end of said box and having a base frame operatively secured to said truck frame,

an elongated hay support finger member pivoted at one end to said base frame and being pointed at the other end for penetrating a bale of hay and supporting the bale along the length of said support finger and said support finger having an axis parallel to the longitudinal centerline axis of said truck bed and the support finger at said one end including a bale end support means, and

power means connected to said hay support finger for pivoting it between raised and lowered positions with said finger extending substantially horizontally rearwardly in said lowered position and adapted to penetrate one end of a hay bale on the ground upon said truck moving rearwardly, and extending upwardly above said truck bed in said raised position for transport of a hay bale positioned between the opposite sidewalls of said truck box and with the bale having been turned from its horizontal ground position to its upwardly extending transport position while being maintained on said finger support member by its weight being substantially carried by said bale end support means on said one end of said support finger.

4,099,630

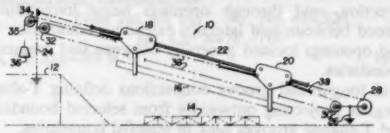
PIPE HANDLING APPARATUS

Don D. Beck, Box 1369, Odessa, Tex. 79760

Continuation of Ser. No. 17,768, Mar. 9, 1970, abandoned. This application Jul. 26, 1971, Ser. No. 165,953

Int. Cl.[2] E21B *19/00*

U.S. Cl. 214—2.5 **27 Claims**



18. A method for transporting a pipe between a derrick floor and a pipe rack which is positioned below the level of and away from the derrick floor comprising:

(a) suspending a main cable in overhanging relation to the derrick floor and the pipe rack such that the portion of the main cable suspended over the derrick floor is higher than the portion of the main cable suspended over the pipe rack;

(b) mounting spaced apart pipe receiving carriages for longitudinal movement on said main cable;

(c) supporting one end of a pipe to be transported in one of said carriages and the other end of said pipe in the other of said carriages;

(d) moving at least one of said carriages along said main cable using second and third cables so as to position the carriage to which said second and third cables are attached, said second and third cables being moved by spaced apart drums rotated in such a manner that said second and third cables move the carriage along said main cable while positively controlling the movement of the carriage in both directions under power; and

(e) controlling the tension in said main cable.

4,099,631

SCRAPER

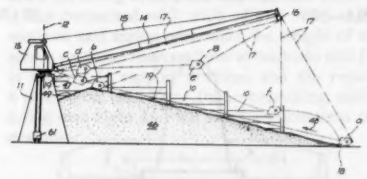
Georg Thierer, Bad Schönborn, and Hans Dolinsek, Stuttgart, both of Germany, assignors to Firma Johannes Fuchs, Ditzingen, Germany

Filed Aug. 18, 1976, Ser. No. 715,431

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621704

Int. Cl.[2] B65G *65/28*

U.S. Cl. 214—10 **8 Claims**



1. Apparatus for scraping piled-up particulate material against a radial feeder comprising a scraper mounted on a support portion of said feeder, an arm pivotably mounted on said support, a scraper bucket suspended from said arm by a lifting cable line connected to a lifting winch, a digging cable line connected at one end thereof to said bucket and at the other end thereof to a digging winch, motor means for driving said winches, clutch means for connecting said winches with said motor means, brake means for braking said winches, manual control means for directly manually actuating said clutch means and said brake means through linkage means interconnecting said manual control means with said clutch means and said brake means respectively, power-controlled means for

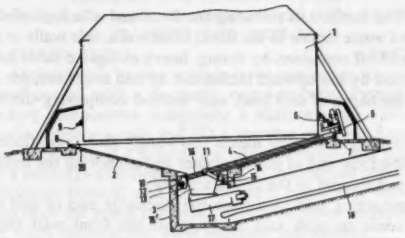
automatically actuating said manual control means, whereby manual and automatic operation are optionally selectable, said radial feeder including a plurality of divider walls extending outwardly therefrom defining a plurality of boxes adapted to contain the particulate material, said scraper bucket being movable along a path to convey the particulate material from the periphery thereof inwardly to a storage area adjacent said feeder and then return to the periphery of the pile of material, means for sensing various positions of said bucket along said path and for generating control signals in response thereto, said arm, together with said scraper bucket carried thereby, being laterally movable over said divider walls to a position over a selected box into which said scraper bucket is adapted to be lowered, an automatically controlled drive for laterally moving said arm, and at least one sensor means for initiating the lowering movement said scraper bucket in response to a predetermined phase position of the lateral pendulous movement of said scraper bucket.

4,099,632

ARRANGEMENT FOR WITHDRAWING MATERIAL FROM A SILO

Stig Ove Berg, Huskvarna, and Rolf Tore Persson, Forshaga, both of Sweden, assignors to C J Wennberg AB, Sweden

Filed Jul. 13, 1976, Ser. No. 704,839
Int. Cl.[2] A01F *25/00*; B65G *65/30*
U.S. Cl. 214—17 DA **5 Claims**



1. An arrangement for withdrawing material from a funnel-shaped bottom portion of a silo comprising a discharge funnel rotatably mounted at the lowest point of the funnel shaped silo bottom and a conveying screw inclined according to the inclination of the funnel-shaped bottom portion of the silo and extending radially outwardly from the discharge funnel through a slot in a wall of the silo, which conveying screw is rotatable about its longitudinal axis by means of a drive arrangement outside the silo wall and a radially outwardly lying end portion of the conveying screw together with the drive being mounted on a first bearing track means extending outside the silo wall in the circumferential direction of the silo and a radially inwardly lying end portion of the conveying screw extending beyond a side of the discharge funnel, being mounted on a second bearing track means extending outside the discharge funnel and below the silo bottom in the circumferential direction of the discharge funnel, and the conveying screw together with the drive being movable in the circumferential direction of the funnel-shaped bottom portion of the silo to produce a sweeping movement over the silo bottom.

4,099,633

DEVICE FOR EVACUATION OF SOLID MATERIALS

Paul Cantenot, 39450 Parcey, Parcey, Jura, France

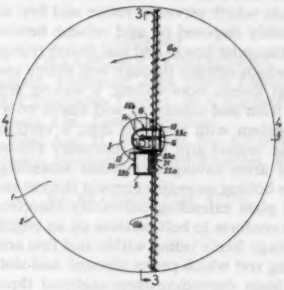
Filed Feb. 4, 1977, Ser. No. 765,602
Claims priority, application France, Feb. 23, 1976, 76 05688
Int. Cl.[2] B65G *65/38*
U.S. Cl. 214—17 DA **4 Claims**

1. A device for evacuating solid materials stored on a covered or uncovered floor or in a bin, through an evacuation orifice in the center of such floor or bin, comprising:

a fixed, non-rotatable frame disposed above the evacuation orifice;

a protective cap disposed above said fixed frame to protect said frame from the stored materials;

an evacuation mechanism supported for rotational movement about a vertical axis through the evacuation orifice by said fixed frame, said evacuation mechanism comprising two horizontally extending worms, each having opposite pitches and together extending substantially to the diameter of the storage area, and first rotation means for providing said worms with a continuous rotational movement about the axes thereof; and



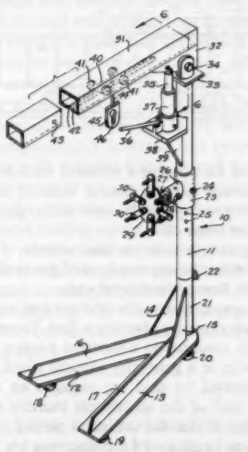
second rotation means, connected to said fixed frame, for causing an automatic discontinuous alternating movement of said worms of substantially 180° around said vertical axis.

4,099,634

COMBINED MOTOR PULLER AND STAND

Robert Lee McIntire, and Timothy Lee McIntire, both of 3325 May St., Sacramento, Calif. 95838

Filed Jan. 3, 1977, Ser. No. 756,379
Int. Cl.[2] B65G *65/04*
U.S. Cl. 214—86 R **1 Claim**



1. A combined motor puller and stand comprising a pair of forked feet joined together to form a substantially V-shaped carriage, brace members disposed on said feet to strengthen said feet, rollers disposed on the bottom extremities of said feet, an upstanding vertical column emanating from said feet at their joining area, a column mount disposed on said feet underlying said column and connected thereto by braces pinned together

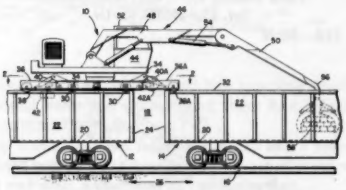
by means of a removable pin, first and second substantially triangular shaped brace members disposed at the joining area of said column and said feet to further fortify the joining area, a hollow substantially rectangular first arm, having a slot horizontally extending on a downward face, pivotally connected to said column at an extremity of said column remote from said feet through a third supporting triangular plate, a shelf supported on said column by a fourth triangular plate below said first arm, a jack member extending between said shelf and said first arm and connected thereto at said third triangular plate which serves to rotate said first arm, a sleeve element slideably disposed on said column between said first and second triangular braces and said fourth triangular plate, a locking pin which extends through said sleeve and column to constrain said sleeve from sliding, a second arm extending horizontally from said column at said sleeve on a side of said column coincident with said first arm, a vertical plate connected to said second arm at an extremity remote from said sleeve, plural arms having bolt means extending outwardly therefrom for bolting an engine element thereto and pivoted to said vertical plate extending outwardly therefrom pivotally adjustable to conform to bolt patterns on an engine element, a wheeled carriage freely riding within said first arm connected to a depending rod which passes through said slot in said first arm, and a chain depending from said rod through a plate connected to said rod so as to support an engine element, a fixed distance below said first arm, whereby when said engine element has been removed from a vehicle with said chain and said jack, the engine element can be fastened to said vertical plate for subsequent work.

4,099,635

GONDOLA CAR LOADER

Thomas E. Leonard, Evergreen, and Walter E. Buckner, Hartselle, both of Ala., assignors to Lucky Manufacturing Company, Huntsville, Ala.

Filed Nov. 5, 1976, Ser. No. 739,283
Int. Cl.² B65G *67/26*
U.S. Cl. 214—152 **2 Claims**



1. A method for moving a wheeled vehicle along the upper edges of generally parallel lateral walls of adjacent, conventional open-topped gondola cars with gaps therebetween, comprising the steps of:

positioning the vehicle so that wheels of the vehicle are supported on the upper edges of generally parallel lateral walls of a first open-topped car;

spanning a gap between the first car and an adjacent second open-topped car by pivoting a first, forward spanning leg, pivotably mounted to a forward portion of the chassis of the vehicle, in a generally vertical plane so that a leading wheel carried by said leg engages an upper edge of a vertical wall of the second car thereby exerting a downward force so that the vehicle is partially supported on the second car by means of the spanning leg to permit at least one wheel of the vehicle to disengage the first car;

driving the vehicle forward whereby a rear portion of the vehicle approaches the gap between the first and second cars;

pivoting a second, rearward spanning leg, pivotably mounted to a rearward portion of the vehicle, in a generally vertical plane so that the vehicle is partially supported by a trailing wheel carried by the second spanning leg to permit at least another wheel of the vehicle to disengage from the first car;

driving the vehicle forward; and,

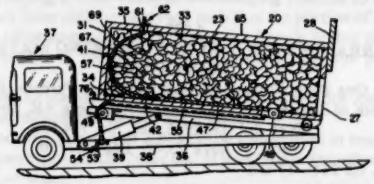
pivoting the second spanning leg so that the vehicle is out of contact with the first car and entirely supported on the second car.

4,099,636

INSTANT LOAD RELEASE METHOD

Lionel G. Frenette, Hudson, N.H., assignor to Victor T. Guertin, Trustee, Nashua, N.H.

Division of Ser. No. 650,256, Jan. 19, 1976, Pat. No. 4,034,880.
This application May 16, 1977, Ser. No. 796,899
Int. Cl.² B60P *1/04*
U.S. Cl. 214—152 **5 Claims**



1. The method of releasing the front end of a load of compacted waste frozen to the floor, front walls, side walls or roof of a roll-off container, by strong, heavy elongated cable means tautened by the upward inclination of said container, for rear end discharge of said load, said method comprising the steps of:

extending said cable means rearwardly along said floor, up the front end of said container and anchoring the terminal end thereof to the container roof;

compacting said load from the discharge end of said container to push said load against the front wall thereof while looping said cable means around the top, front and bottom of the front end of said load

and then, during raising of said container for rear end discharge by gravity; tautening said cable means to straighten out the looped cable means, thereby exerting compressive, squeezing forces on the front portion of said load to release the same from any adherence to the inside faces of said container.

4,099,637

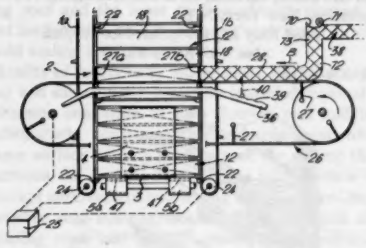
RECEPTACLE EMPTYING DEVICE FOR ELONGATED CYLINDRICAL ELEMENTS

Desmond Walter Molins, London, England, assignor to Molins Limited, England

Division of Ser. No. 276,302, Jul. 31, 1972, Pat. No. 3,967,740.
This application Apr. 28, 1976, Ser. No. 681,247
Claims priority, application United Kingdom, Aug. 2, 1971, 36319/71
Int. Cl.² B65G *47/52*
U.S. Cl. 214—306 **19 Claims**

1. Apparatus for removing rod-like articles from a container, comprising means for moving a succession of containers through an unloading station, each container carrying at least one batch comprising a stack of said articles; means for successively removing batches from said containers at said unloading station; conveyor means for successively receiving batches removed from said containers; retaining means for confining said batches on said conveyor means and for separating the successive batches which are disposed therebetween; and

means for withdrawing said retaining means so that successive batches received on said conveyor means become combined



and may be moved away from said unloading station as a continuous stream of articles on said conveyor means.

4,099,638

COATED GLASS BOTTLES

Tetsujiro Tatsumi; Reiji Miyamoto; Shiro Narasaki, all of Ichihara; Seiji Kazama, Kawanishi, and Michio Tanaka, Takatsuki, all of Japan, assignors to Mitsui Polychemicals, Co., Ltd., Tokyo and Takeda Chemical Industries, Ltd., Osaka, both of, Japan

Filed Mar. 7, 1977, Ser. No. 775,642

Claims priority, application Japan, Mar. 9, 1976, 51-25971

Int. Cl.[2] B65D *11/16;* **B32B** *27/40*

U.S. Cl. 215—12 R **15 Claims**

1. A glass bottle having a single-layer coating on the surface thereof coated with a thermally cured material formed of a powdery composition comprising a mixture of (i) a blocked organic polyisocyanate and (ii) a member selected from the group consisting of a hydrolyxed ethylene-vinyl ester copolymer, a carboxyl-modified version of the hydrolyzed copolymer or mixtures thereof, said ethylene-vinyl copolymer being selected from the group consisting of vinyl acetate, vinyl propionate, vinyl butyrate and vinyl benzoate copolymers.

4,099,639

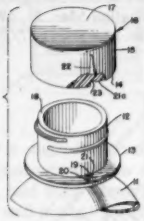
CHILD RESISTANT CLOSURE

Leo M. Boxer, and Robert W. Boxer, both of Fox Point, Wis., assignors to Lewis, Pauls & Associates, Ltd., Miami, Fla.

Filed May 16, 1977, Ser. No. 797,565

Int. Cl.[2] B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—209 **12 Claims**



1. A child resistant closure for a container having a threaded neck thereon, comprises a cap having an internally threaded cylindrical skirt with an annular end surface and a disc-shaped end wall for sealing engagement on the end of the threaded neck, a yieldable circular collar on the neck of the container in a position to be engaged by the end surface of the cap skirt, said yieldable collar being integral and unitary with the container and being continuous, and complementary projection and recess means on the skirt end surface and collar in a position to be cooperatively interengaged when the cap is threaded fully onto the neck of the container, said collar being yieldable by manual pressure thereon to release the interengaged projection and recess means to enable retrograde movement of the cap from the neck and having a substantially constant diameter and uniform shape, said collar projecting radially beyond the cap skirt a uniform distance for the entire circumference of said collar and beyond the cap skirt only sufficiently far enough to enable manual engagement and downward flexing thereof by an adult.

4,099,640

COLLAPSIBLE CONTAINERS

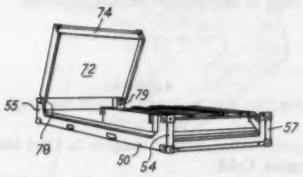
Stanley Nessfield, Tibthorpe; John Elliott Foster, Godalming, and Martin Clive-Smith, London, all of England, assignors to Sea Containers, Ltd., London, England

Filed Apr. 21, 1976, Ser. No. 679,086

Claims priority, application United Kingdom, Apr. 24, 1975, 17126/75

Int. Cl.[2] B65D *7/24, 87/00*

U.S. Cl. 220—6 **13 Claims**



1. A collapsible container having a base, two pairs of opposed walls hinged to the base for folding inwardly on the base into a collapsed position, a detachable roof member supported on the upper portions of the walls when the latter are erect, a stub corner post fixed vertically at each of four corners of the base, the top of each stub corner post being terminated in a bearing surface for supporting a corner post of a hinged wall of the container when the side wall is erect, each corner post being hinged to its stub corner post about an axis displaced from the stub corner post towards the interior of the container to thereby hinge the said wall to the base, the area of the roof member in plan being less than that of the base whereby the roof member may be separately positioned within the stub corner posts for stowage, the remainder of the container roof being formed by upper portions of at least some walls of the container, said bearing surface at the top of each stub corner post having a longitudinally oriented slot extending around into an inner side wall, the slot being shaped to perform two functions; the first being to act as a top-lift anchorage to permit the handling of the container in the collapsed position by standard container-handling equipment, and the second function being to so accommodate an arm connecting the corner post to its hinge that in the erect position the corner posts standing on the stub corner posts which extend the stub corner posts to the full height of the container are positively positioned over the stub corner posts by said arm being engaged in its corresponding slot.

4,099,641

PRESSURE TANK FOR HOT-WATER HEATERS

Heinz Schiedat, Hoxter, Albaxen, Fed. Rep. of Germany, assignor to Stiebel Eltron GmbH & Co. KG, Holzminden, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 766,495

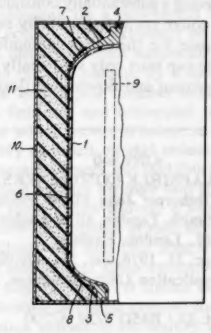
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605103; Dec. 2, 1976, 2654585

Int. Cl.[2] B65D *25/18*

U.S. Cl. 220—444 **10 Claims**

1. A pressure tank, particularly for hot water heaters, com-

prising: a synthetic liner; a glass fiber wrapping reinforcing said liner; and synthetic material means only at predetermined



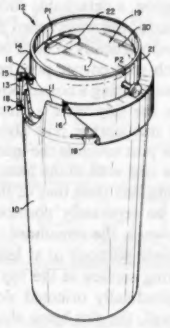
locations of said liner for fixing said glass fiber wrapping to said liner only at said predetermined locations.

4,099,642

DRINKING RECEPTACLE COVER AND VALVE ASSEMBLY

Orv Nergard, Fridley, Minn., assignor to Dart Industries, Inc., Los Angeles, Calif.

Filed Dec. 1, 1977, Ser. No. 856,390
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—90.4 **10 Claims**



1. A cover and valve assembly for covering the open top of a drinking receptacle, including:

(a) a plate having top and bottom surfaces;

(b) an annular rim surrounding said plate having a first point on said rim with a second diametrically opposite point, said plate having a beverage outlet opening adjacent to said first point;

(c) a valve head beneath said opening in said plate having resilient support means extending therefrom secured to the bottom surface of said plate biasing the valve head upwardly against the bottom periphery of said opening to normally close said opening; and,

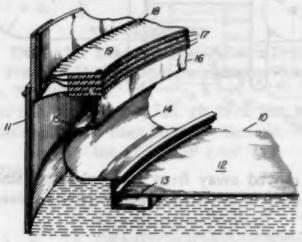
(d) an actuating member passing through a side opening in said rim beneath the undersurface of said plate, said member terminating in a camming surface engaging a portion of said valve head such that when said member is urged inwardly through said side opening in said rim it cams said valve head away from said opening to thereby open the same so that a person can drink a beverage from any receptacle over which said cover has been positioned.

4,099,643

SEAL FOR FLOATING ROOF TANK

John Albert Wardwell; Ray Alan Stewert, both of Torrance, and Ralph Gee Chow, Tarzana, all of Calif., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 799,015
Int. Cl.[2] B65D *87/20*
U.S. Cl. 220—222 **1 Claim**



1. In a floating roof tank having a vertical wall of circular shape adapted to contain a stored volatile liquid, a buoyant roof floating on said stored liquid and extending to the interior side of said wall and a dependent sealing element extending downwardly from the periphery of said roof to engagement with said wall, an auxiliary seal mounted on the periphery of the upper surface of said roof and spaced above said dependent sealing element thus defining a vapor space between said dependent sealing element and said auxiliary seal, said auxiliary seal being constituted by a plurality of substantially horizontal layers each constituted by a plurality of segments of which the adjacent ends are overlapped, said layers being vertically spaced one from the other and having the edges thereof remote from said roof in engagement with said wall, and closure means connecting the inner edges of said layers to said roof adapted to inhibit leakage from spaces defined by said layers;

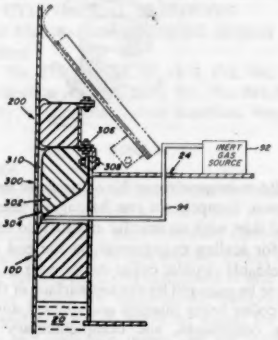
the improvement wherein the said horizontal layers are radially slit from the edges thereof adjacent said wall to a region intermediate said edges and said closure means to form a plurality of radial fingers engaging said wall.

4,099,644

LOW EMISSION MULTIPLE SEALING SYSTEM FOR FLOATING ROOF TANKS

Wayne E. Nuttall, San Gabriel, and William H. Page, Long Beach, both of Calif., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 674,354, Apr. 7, 1976, abandoned. This application Mar. 31, 1977, Ser. No. 783,255
Int. Cl.[2] B65D *87/20*
U.S. Cl. 220—225 **20 Claims**



1. A low emission sealing arrangement adapted for use in a

liquid storage tank of the variety having a floating roof of a diameter slightly less than the diameter of such tank, said sealing arrangement sealing the annular space between the floating roof and the inner surface of such storage tank to prevent the loss of at least a portion of such liquid by vaporization, said sealing arrangement comprising:

a plurality of functionally independent, effective vapor sealing and substantially vertically spaced diffusional sealing elements attachable to such floating roof and being in substantially constant slideable engagement with such inner surface of such storage tank for sealing the space between the floating roof and the inner surface of such storage tank, each of said sealing elements providing a seal between such inner surface of said storage tank and such floating roof, said sealing elements being separated for providing at least one stagnant space located therebetween for protecting the integrity of the diffusional path length of the sealing elements located therebelow and confining the effects of wind and wind eddying to the upper sealing elements, said sealing arrangement having a total vertical dimension sufficient to contain a large proportion of the evaporation of any liquid left on the inner surface of such storage tank during normal diurnal and unloading descension of such floating roof within such storage tank;

means for reducing the volume between successive sealing elements for creating a more easily saturated space therebetween; and

means for supporting said plurality of vertically spaced sealing elements upon such floating roof in a sealed relationship thereto.

4,099,645

FUEL TANK, ESPECIALLY FOR MOTORCYCLES

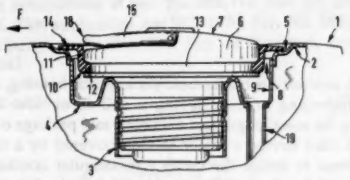
Hans-Albrecht Muth, Hechendorf, Pilsensee; Dirk Reissig, Schweitenkirchen, and Hans-Günther v.d. Marwitz, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed May 6, 1977, Ser. No. 794,386

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 7616881[U]

Int. Cl.² B65D *51/16, 53/02*

U.S. Cl. 220—304 **16 Claims**



1. A fuel tank for a single-track vehicle, comprising tank wall means, a filler connection means arranged in a recess in the tank wall means, said filler connection means being connected with the tank wall means by way of an annular channel means having inner and outer wall means, said filler connection means being closed by a cover means arranged in said recess, characterized in that the cover means is constructed flush with the contour of the tank wall means in the closing position and is so constructed that when in the closing position the annular channel means is not completely covered by said cover means such that a gap exists between the outer portion of the cover means and one of the means selected from the group consisting of the outer annular channel wall means and the tank wall means, and wherein said gap is covered off by a ring means of soft elastic material having an outer diameter greater than the diameter of the said cover means.

4,099,646

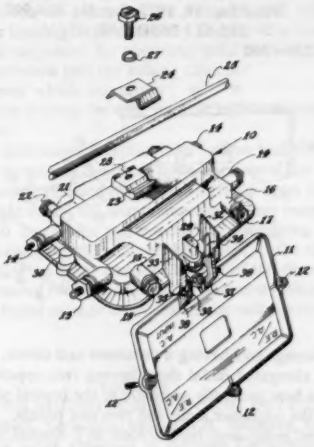
HOUSING AND COVER RETAINING MEANS

Alan E. Devendorf, Phoenix, N.Y., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Jul. 25, 1975, Ser. No. 599,286

Int. Cl.² B65D *45/16, 53/00*

U.S. Cl. 220—324 **3 Claims**



1. A CATV distribution housing having a cover and a cover retainer, the cover retainer comprising: a pair of slotted members located on an outer surface of the housing; the pair of slotted members having slots that are open at one end thereof, the slots being positioned to face each other; and a pair of projecting tabs facing away from each other and positioned on the cover, the pair of tabs being located to mate within the slots of the pair of slotted members, the pair of slotted members and the pair of projecting tabs cooperating to retain the cover with the housing wherein the pair of slotted members extend beyond a surface of the housing containing the opening, the extensions of the pair of slotted members being provided to accommodate thick gaskets located around the surface of the opening and to allow the cover to swing into position over an opening in the housing.

4,099,647

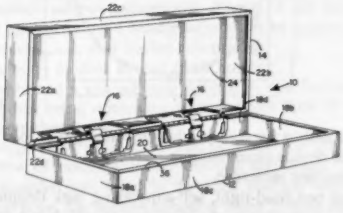
HINGE MOUNTING MEANS

George G. Bergh, and Robert G. Bergh, both of Plainville, Mass., assignors to Bergh Bros. Co., Inc., Attleboro Falls, Mass.

Filed Jun. 6, 1977, Ser. No. 803,764

Int. Cl.² B65D *43/14, 51/04*

U.S. Cl. 220—334 **17 Claims**



1. Mounting means for fixing a hinge relative to a container wall at a location thereon which is defined in part by a longitudinally extending wall edge, comprising: a hinge receiving element having an inner plate joined to an outer lip by an intermediate web; cooperating means on said hinge receiving element and said container wall for urging said intermediate

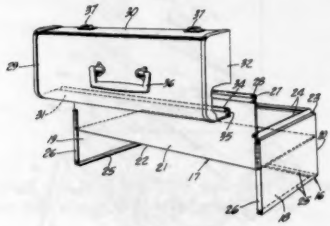
web against the wall edge with said container wall being located between and reinforced by said inner plate and said outer lip; and, means for attaching the hinge to said inner plate.

4,099,648

STORAGE BOX

Richard G. Kirkton, 1994 Midwick Dr., Altadena, Calif. 91101

Filed Sep. 19, 1977, Ser. No. 834,597
Int. Cl.[2] B65D *7/00, 43/16*
U.S. Cl. 220—340 **5 Claims**



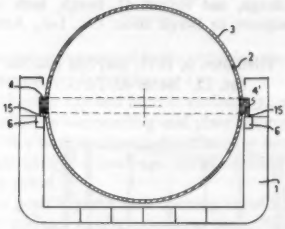
1. A storage box having a container and cover, comprising:
a first elongated metal sheet having two opposite end portions bent generally normally to the central portion forming the container front and two end panels;
a second metal sheet bent to form an L-shaped member, said member being secured to the first metal sheet defining back and bottom panels for the container;
the exposed edges of the front, two end and back panels being contoured into generally cylindrical edges; and
the cover includes an edge which is rolled into cylindrical shape and mated with the container rear panel edge to form a hinge between the cover and the container.

4,099,649

APPARATUS FOR TRANSPORTING FLUIDS AT LOW TEMPERATURE

Jacques R. Guilhem, Sainte Adresse, and Pierre Jean, Montivilliers, both of France, assignors to Gaz-Transport, Paris, France

Filed May 21, 1976, Ser. No. 688,839
Claims priority, application France, May 22, 1975, 75 15964
Int. Cl.[2] B65D *87/24;* **B63B** *25/16*
U.S. Cl. 220—439 **14 Claims**



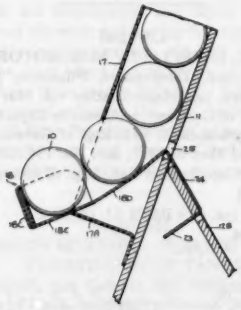
1. In a device for transporting liquefied gas at low temperature, said device comprising
a supporting structure,
at least one fluid-tight, self-supporting tank defining a volume of revolution the meridian of which is a curve free from sharp angles, said tank having an equator,
a ring fixed to the supporting structure and supporting said tank,
spacers made of a heat insulating material positioned between said ring and said tank,
a plurality of circumferentially distributed radial slides positioned between said spacers and connecting said tank to said ring, said spacers having a thickness such that said tank is supported on said spacers rather than said slides, said slides each comprising:
a female element having a U-shaped opening and a male element extending into the female element and of a size smaller than the U-shaped opening so that there are spaces between the sides of each male and female element, and guides of insulating material in said spaces between each male and female element to minimize heat loss at the slides;
an insulating layer encircling the wall of the tank,
a hollow toroidal member encircling said tank at said equator, and having portions thereof on opposite sides of the equator secured to said tank, said toroidal member being filled with an insulating material and supported by said spacers on the ring fixed to the supporting structure, said toroidal member having a transverse section which imparts a transverse rigidity thereto such that, when subjected to torques by those loads and forces to which the tank is subjected during use, the maximum rotation of said transverse section is less than one degree.

4,099,650

CONVERTIBLE BLISTER-CARD PACKAGE

Vincent J. Immordino, Flushing, N.Y., assignor to Display Originals, Inc., West Babylon, N.Y.

Filed Jan. 24, 1977, Ser. No. 762,055
Int. Cl.[2] B65G *59/06*
U.S. Cl. 221—266 **7 Claims**

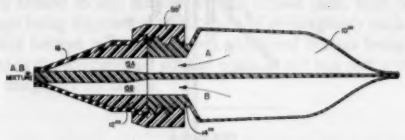


1. A convertible blister-card package for housing, displaying and dispensing articles having a roll form, said articles all having the same length and diameter, said package comprising:
A. a card having a major section covered by a transparent dome to define therewith a rectangular container whose width is substantially equal to the length of the articles for housing a stack of said articles, said dome having an access opening at the lower end thereof whose height is greater than the diameter of one of said articles and less than twice said diameter:
B. an open box seated in the lower end of said container to receive the lowermost article in said stack, said box having a base, a pair of side walls and a relatively high rear wall which is free of the side walls and normally lies against said card, said rear wall being hinged from said card whereby said box may be pulled out through said access opening to cause said rear wall to swing out from said card to assume an inclined position in which it is substantially co-planar with the base to define a chute for dispensing said articles, at which pulled-out position the lowermost article is removable from said box and the article directly thereabove which lies on said inclined rear wall is trapped within the access opening.

4,099,651
CLOSURE ASSEMBLY FOR COLLAPSIBLE TUBE DISPENSERS, AND THE LIKE

Emil H. von Winckelmann, 7731 Amestoy Ave., Van Nuys, Calif. 91406

Filed May 22, 1975, Ser. No. 579,786
Int. Cl.² B65D *35/50*
U.S. Cl. 222—94 **3 Claims**

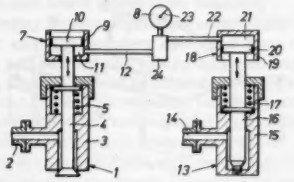


2. A closure assembly for a collapsible tube to control the discharge of fluids and soft solids from the tube, said tube having a neck through which the fluids and soft solids are dispensed, said closure assembly comprising: a hollow tubular tip member extending outwardly from the neck of the collapsible tube, at least one side of the tip member having an opening therein extending from said one side thereof into the hollow interior of the tip member; and a flexible sleeve open at both ends drawn over the tip member and over the opening therein in close engagement with the tip member along the length thereof, said sleeve forming a seal around the distal end of the tip member, whereby squeezing pressure applied to the tube causes the fluids and soft solids to pass out the opening in said tip member and between the sleeve and the distal end of the tip to be dispensed therethrough, and which includes a cap member fitted over the tip and secured to the neck of the tube, and in which said cap member has an internal configuration complementing the configuration of the tip and flexible sleeve to fit closely over the tip and flexible sleeve and lock the sleeve in a closed position over the tip.

4,099,652
APPARATUS FOR MIXING FLUID COMPONENTS WHICH REACT QUICKLY WITH ONE ANOTHER TO FORM A BLOWABLE, FOAM-FORMING MIXTURE

Karl Breer, Cologne, Germany, assignor to Bayer Akdtiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 209,380, Dec. 17, 1971, abandoned, which is a continuation of Ser. No. 885,774, Dec. 17, 1969, abandoned. This application Apr. 22, 1974, Ser. No. 463,021
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1969, 1903243
Int. Cl.² B67D *5/08*
U.S. Cl. 222—135 **3 Claims**



1. In apparatus suitable for mixing two fluid components which react quickly with each other forming foam, comprising:

(a) a pump for each component, and means for simultaneously operating said pumps,

(b) a mixing chamber for receiving, mixing, and discharging the components for reaction thereof,

(c) a conduit between each pump and the mixing chamber for delivery of the components from the pumps to the mixing chamber,

(d) a valve in each conduit between the pump and the mixing chamber and responsive to pump discharge pressure to open when exposed to a selected pump discharge pressure, for the introduction of the components into the mixing chamber,

(e) a liquid storage arrangement in at least one of said conduits between the pump and the valve thereof, adjusting means for limiting displacement by said liquid in the liquid storage arrangement for obtaining simultaneous entry of said components into the mixing chamber,

the improvement which comprises:

(f) a timer for sensing the time interval between opening of the valves,

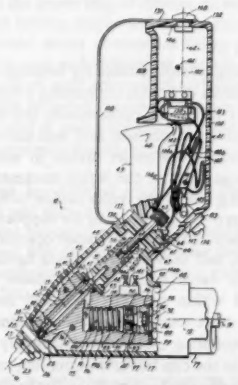
(g) means interconnecting the inlet valves and the timer effective to actuate the timer upon opening of the first of the valves to open and inactivate the timer upon opening of the other valve, the interconnecting means comprising pneumatic means for pneumatically transmitting pulses corresponding to operation of the valves, to the time for actuation of the timer and inactivation of the timer,

whereby the timing of the opening of the valves is indicated for adjusting the liquid storage arrangement for said simultaneous entry.

4,099,653
MOLTEN ADHESIVE DISPENSING DEVICE

Charles H. Scholl, Vermilion, and Alan B. Reighard, Bay Village, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 565,733, Apr. 7, 1975, Pat. No. 4,006,845. This application Nov. 10, 1976, Ser. No. 740,401
Int. Cl.² B67D *5/62*
U.S. Cl. 222—146 HE **2 Claims**



1. A molten adhesive dispensing device of the hand gun type, said gun including a handle adapted to be gripped by an operator during use, said device comprising

a heater body located in said gun's housing,

a first bore and a second bore defined in said heater body, said bores being connected to permit the flow of molten adhesive therebetween,

a discharge valve mounted in said first bore for controlling the flow of molten adhesive through said bores,

a heat transfer core fixed in threaded position within said second bore, the molten adhesive being in heat exchange contact with both said core and said heater body as it flows through said second bore, said heater body's second bore surface being provided with spiral threads thereon, and said heat transfer core's outer surface being provided with spiral threads thereon, the threads of said heat transfer core being sized relative to the size of said bore threads

such that said core can be threaded into said bore and such that said threads cooperate to define a spiral path about said core through said bore from one end to another, thereby defining a spiral heat exchange path through said second bore,

heater means disposed in said device for heating molten adhesive as it flows through said heater body, said heater means comprising at least one cartridge type heater disposed within said heater body, and

thermostat means mounted in said device, said thermostat means being interconnected with said heater means to control the temperature of said heater body and said heat transfer core, said thermostat means thereby being operable to control the temperature of said molten adhesive within said hand gun device.

4,099,654

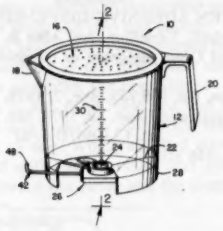
SELECTIVE DISPENSING UTENSIL

Angelo Antolino, Pelham Manor, N.Y., assignor to New Colony Inventions, Inc., Mt. Vernon, N.Y.

Filed May 11, 1976, Ser. No. 685,283

Int. Cl.[2] B67C *11/04*

U.S. Cl. 222—184 **7 Claims**



1. A dispensing utensil suitable for treating and discharging measured quantities of liquids comprising a substantially cylindrical cup body having an open mouth, the body including a transverse interior wall surface, said wall surface being sloped toward and defining an outlet orifice in said cup body for gravity discharge flow of the liquid contents, the cup body further extending below the outlet orifice to form a skirt wall, said skirt wall providing a pedestal for supporting the cup on a horizontal surface, flow control means operable for regulating discharge flow, said flow control means having an externally mounted sluice valve assembly, said sluice valve assembly being recessed within the skirt wall and including a valve housing and a valve member slidably accommodatable within said housing, coupling means for detachably connecting the valve housing to the cup body, the coupling means including a depending collar formed integrally with the cup and surrounding the outlet orifice, said depending collar being adapted for interfitting, manually separable, fluid tight engagement with the valve housing for removably securing the valve housing to the cup in registration with the outlet orifice, said valve housing further having a discharge port, said slidable valve member having an extension projecting through an opening formed in the skirt wall, said extension providing accessibility to the recessed valve assembly for permitting selective displacement of the valve member with respect to the discharge port to regulate discharge flow from the cup, said valve assembly being detachable as a unit from the cup body with the valve member being positioned to seal the discharge port, the valve member further being withdrawable through the opening in the skirt wall and removable from within the valve housing, whereby the component valve elements can be readily disassembled and separated for cleaning.

4,099,655

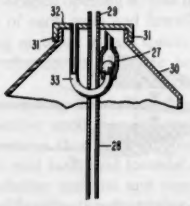
POSITION RESPONSIVE TWO-WAY BALL VALVE

L. Laslo Por, Christiansted P.O. Box 37, St. Croix, V.I.

Filed Nov. 26, 1976, Ser. No. 745,449

Int. Cl.[2] B05B *11/04*

U.S. Cl. 222—211 **4 Claims**



1. A submersible, automatically functioning, pressure and position responsive air valve for a compressible container, comprising:

a closure member for a compressible container;

a first-U-shaped air inlet tube connected through said closure member to atmosphere, said air inlet tube depending from said closure and adapted to extend into the container;

a tubular housing having an upper ball seat at one end and a lower ball seat at the other end, the lower ball seat being connected through said U-shaped air inlet tube to communicate with the atmosphere, and the upper ball seat being connected through a second air inlet tube to communicate with the interior air content of the container; and

a ball valve located within said tubular housing and freely movable therein, the position and movement of the ball valve within said housing being directed by gravitation and air pressure so that the ball valve engages said lower ball seat to close said air inlet tube to flow due to compression of the container when the container is in an upright position, and so that the ball engages said upper ball seat upon inversion of the container to open said air inlet tube to flow due to compression of the container.

4,099,656

MULTI-PURPOSE CARRYING BAG OR CASE

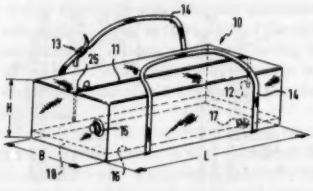
Henning Neumann, Munich; Horst Schalausky, Pocking, and Horst Britschinn, Munich, all of Fed. Rep. of Germany, assignors to Metzeler Kautschuk AG, Munich, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,632

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 7607449[U]

Int. Cl.[2] A45F *5/00*

U.S. Cl. 224—5 W **7 Claims**



1. A multi-purpose carrying bag or case having a parallelpiped shape and comprising: a shell of a watertight and airtight, rip-resistant material, said shell defining an interior and having top and bottom portions, first and second longitudinal side portions and first and second end portions, said bottom portion comprising two coextensive layers of said watertight and airtight, rip-resistant material which form a watertight and airtight bottom compartment in said carrying bag or case and

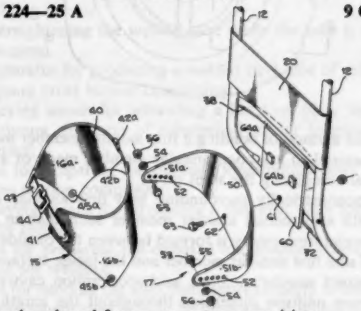
a first fill-valve which communicates with the interior of said compartment and is accessible from the interior of said bag; a slot-type opening provided in said upper portion and being closeable by means of a watertight and airtight zipper; a second fill-valve provided in said shell for filling the interior of the carrying bag or case; and a longitudinally adjustable carrying strap movably connected to said shell and six fittings adapted for the arbitrary insertion of the carrying strap, said fittings being affixed to said bottom portion of said shell, four of the fittings being disposed at the corners of an imaginary rectangle on said bottom portion and two additional fittings being disposed in the longitudinal median plane of the bag and without said imaginary rectangle.

4,099,657

BACKPACK AND FRAME APPARATUS

Anthony C. Zufich, P.O. Box 333, Bodfish, Calif. 93205

Filed May 26, 1976, Ser. No. 690,068
Int. Cl.[2] A45F *3/10*
U.S. Cl. 224—25 A **9 Claims**



1. A backpack and frame apparatus comprising:

(a) a frame comprising a pair of side bar members and upper and lower lateral cross members connecting said side bar members;

(b) an upper support tube coupled intermediate a pair of upper cross members, said upper support tube with vertically oriented adjustment apertures in spaced relation to each other and aligned parallel to said side members;

(c) a pair of shoulder straps, the upper ends thereof being coupled to vertically aligned adjustment apertures;

(d) a hip belt including an engagement member adapted to encircle the waist of a user, said hip belt including a pair of gussets extending downwardly from diametrically opposed sides of said hip belt, the lower projection of said gussets being substantially below said engagement member and adapted to be adjacent the hips of the user and be diametrically opposed to one another;

(e) means for attaching the lower ends of said shoulder straps to respective ones of said side bar members substantially adjacent said lower lateral cross members;

(f) a supporting frame comprising a substantially planar rear member and side members extending from either edge thereof, said side members being deflected from said planar rear member parallel to respective ones of said gussets, the termini of said side members being in parallel spaced relation to each other and including a plurality of aligned adjustment apertures, a respective pair of adjustment apertures in each of the side members of supporting frame being coupled to the lower projection of the adjacent gussets of said hip belt diametrically opposed to one another;

(g) lower bearing surfaces secured between lateral lower cross members intermediate said pairs of said bar members; and

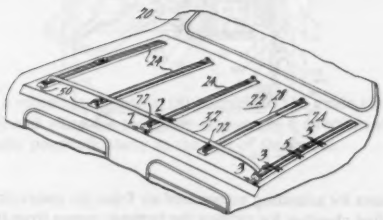
(h) means for pivotally coupling the planar rear member of said supporting frame to said lower bearing surfaces about an axis substantially perpendicular to said planar rear member whereby said hip belt and supporting frame are free to reciprocally move about said axis independent of said frame.

4,099,658

ARTICLE CARRIER FOR AUTOMOTIVE VEHICLES

John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 486,415, Jul. 8, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 743,602
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.[2] B60R *9/00*
U.S. Cl. 224—42.1 F **85 Claims**



1. An article carrier for an automobile including more than two parallel slats fixedly secured on a generally horizontally extending exterior automobile body surface,

said slats extending generally longitudinally of the automobile,

certain of said slats having an upper article supporting surface,

said supporting surfaces being located between said body surface and the lower side of articles on said carrier, each of said slats having major and minor transverse dimensions with said major dimensions being parallel to said body surface and said supporting surface, first fastening means associated with selected of said slats,

a pair of article securing members disposed upon said selected slats and a restraining bar extending laterally between and secured adjacent its opposite ends to said members,

said restraining bar located above said automobile body surface and said slats, and

second fastening means on each of said members and cooperable with said first fastening means for detachably securing and longitudinally adjusting said members and said restraining bar upon said slats.

4,099,659

ADJUSTABLE PNEUMATIC POWER DRIVING APPARATUS

David C. Grimaldi, Jr., 458 George St., Ridgewood, N.J. 07450

Filed Oct. 15, 1976, Ser. No. 732,805
Int. Cl.[2] B25C *1/04*
U.S. Cl. 227—130 **11 Claims**

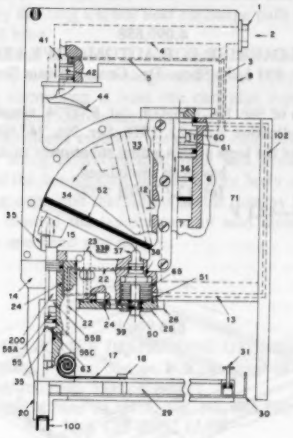
1. Pneumatically powered apparatus for driving fasteners such as staples, nails, rivets, joint fasteners, spring pins and the like, comprising:

a housing having a reservoir for pressurized air and a first chamber;

hammer means for developing power, provided in the first chamber movable between a first position and a second position, and pivotally mounted in the housing;

ram means for transmitting power from the hammer means to a fastener, positioned adjacent the second position of the hammer means, and being movably mounted in the

housing to be struck by the hammer means for driving a fastener; and



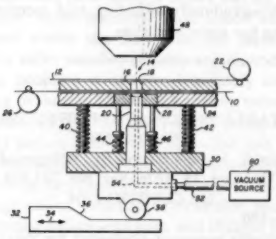
means for admitting pressurized air from the reservoir to the first chamber for moving the hammer means from the first position to the second position.

4,099,660

APPARATUS FOR AND METHOD OF SHAPING INTERCONNECT LEADS

James Edward Schultz, Sunnyvale, and Carmen D. Burns, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 31, 1975, Ser. No. 627,759
Int. Cl.[2] H01L *21/603*
U.S. Cl. 228—13 10 Claims



1. A method of shaping interconnect leads which have been cut from an interconnect lead tape and which are each joined to a respective bump on a semiconductor chip, such that said leads and chip form a unitary article, comprising the steps of:

(a) holding the free ends of said leads in one plane, and

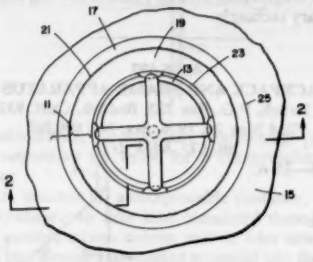
(b) applying a differential fluid pressure across said article to bend all of said leads uniformly and the same amount downwardly, whereby the chip is translated downwardly to a position which is spaced below said one plane in which the free ends of said leads are held.

4,099,661

METHOD FOR CONNECTING BIMETALLIC MEMBERS BY EXPLOSIVE BONDING

Charles B. Dick, Port Orchard, Wash.; Curtis L. Knutson, Tulsa, Okla.; Frederick W. Jones, Upper Marlboro, and Richard D. Ireland, Chevy Chase, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 761,917
Int. Cl.[2] B23K *21/00, 19/00*
U.S. Cl. 228—107 5 Claims



1. The method of bonding a first annular member made of a first material to a second annular member made of a second material comprising the steps of:

(a) concentrically surrounding said first annular member with said second annular member such that an annular acceleration cavity is formed between the outside surface of said first annular member and the inside surface of said second annular member, said acceleration cavity having about uniform dimension throughout the length of said acceleration cavity;

(b) surrounding the outside surface of said second annular member with an explosive powder; and

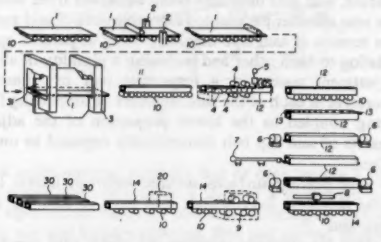
(c) igniting said explosive powder, said ignition causing said second material to accelerate across said annular acceleration cavity and deposit on and bond to the outside surface of said first annular member.

4,099,662

METHOD AND APPARATUS FOR PRODUCING WELDED STEEL TUBES HAVING LARGE SQUARE CROSS SECTION

Hiromu Nakajima, Itami, Japan, assignor to Kabushiki-Kaisha Nakajima, Osaka, Japan

Filed Dec. 15, 1976, Ser. No. 750,779
Claims priority, application Japan, Dec. 20, 1975, 50-152105; Feb. 9, 1976, 51-13505; Feb. 9, 1976, 51-13506; Feb. 9, 1976, 51-13507; Feb. 9, 1976, 51-13508
Int. Cl.[2] B23K *31/02*
U.S. Cl. 228—151 10 Claims



1. A method of producing a welded steel tube of relatively large square cross section comprising:

advancing a single steel plate of at least substantially 9mm

thickness longitudinally thereof while preparing the opposed longitudinal edges of same for welding;

bending swquentially a first longitudinally extending portion of the steel plate adjacent one free edge thereof and then a second longitudinally extending portion of the plate to be bent into the next adjacent corner portion, then bending a third longitudinally extending portion of the plate adjacent the other free edge thereof and finally a fourth longitudinally extending portion of the plate intermediate said second and fourth portions corresponding to the four corners of the square steel tube to be produced to thereby shape the plate to a form approximate to the desired square steel tube having opposed free edges extending longitudinally of the plate;

subjecting the thus shaped plate to further shaping and to tack welding along said free edges to the form of the square steel tube while continuing to advance the plate longitudinally;

welding the opposed free edges of the thus formed square steel tube from inside and outside the tube by automatic welding means;

and straightening the welded tube while the tube is further advanced.

6. Apparatus for producing a welded steel tube of relatively large square cross section comprising:

conveying means for advancing a flat steel plate having a minimum thickness of substantially 9mm longitudinally thereof;

means for preparing the opposed longitudinal large square cross section comprising:

conveying means for advancing a flat steel plate longitudinally thereof;

means for preparing the opposed longitudinal edges of the plate for welding,

means for bending the steel plate approximately to the shape of the square steel tube to be produced in which opposed free edges of the plate extend longitudinally and in spaced relation;

means for further shaping the bent plate to the square steel tube and for bringing said free edges into abutting relation;

tack welding means for tack welding said tube longitudinally along said free edges;

automatic welding means for welding the opposed free edges of the bent steel plate from inside and from outside the tube;

and means for straightening the square tube after welding;

said conveying means being adapted to advance the steel plate sequentially and continuously from said edge - preparing means to said straightening means.

4,099,663

SEVERING WIRE OR RIBBON MATERIAL ADJACENT AN ATTACHMENT POINT, SUCH AS A SOLDER, BOND OR WELD CONNECTION, PARTICULARLY IN SEMICONDUCTOR AND THIN FILM STRUCTURES

Klaus Brill, Korntal, and Günter Schmid, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 11, 1977, Ser. No. 776,737

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616521

Int. Cl.[2] B23K *31/02*

U.S. Cl. 228—159 15 Claims

1. Method to attach a strand (1) such as by a solder, bond, or weld connection to a substrate and then to sever the strand (1) adjacent the attachment point (2) comprising the steps of

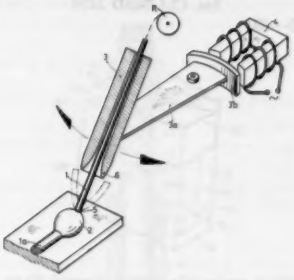
guiding the strand to the attachment point (2);

attaching the strand;

subjecting the stand to repetitive bending stresses and continuing the bending stresses until the materials fails by moving the strand as guided, repetitively in a direction essentially perpendicular to the major axis of the strand.

6. Wire guiding and severing apparatus to sever a strand (1) having a central axis adjacent an attachment point (2) such as a solder, bond or weld connection, comprising

a guide element (3) having a body with an opening formed therein just slightly larger than the strand (1) to guide the strand with slight clearance above its axis;



and a vibrating apparatus (4) coupled to the guide element (3) and vibrating the guide element in a direction essentially perpendicularly to the axis of the strand.

4,099,664

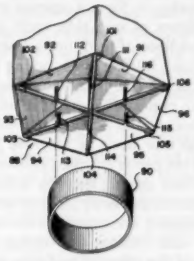
BOTTOM SECUREMENT DEVICE FOR POLYGONAL CARTON WITH BOTTOM REINFORCING RIBS

Walter B. Swan, 1400 W. 44th St., Chicago, Ill. 60609

Continuation-in-part of Ser. No. 719,245, Aug. 31, 1976, which is a division of Ser. No. 601,593, Aug. 4, 1975, Pat. No. 3,977,594. This application Sep. 1, 1976, Ser. No. 719,405

Int. Cl.[2] B65D *5/12*

U.S. Cl. 229—5.7 6 Claims



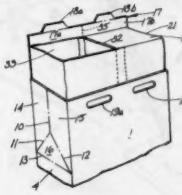
1. In a polygonal carton having a plurality of side panels and a strong, weight supporting bottom comprising a plurality of generally triangular bottom panels equal in number to the side panels and a plurality of interconnecting webs each extending between a pair of adjacent bottom panels being hingedly connected to one of the side panels and being inclined upwardly from the bottom edge of the side panel to which it is connected so as to form an acute angle therewith, the improvement comprising:

a device for engaging the reinforcing ribs on the bottom of said carton to secure them in place thereby also to secure the bottom panels in place, said device being generally disc shaped with a plate portion and protrusions extending upwardly from one side of said plate portion, said protrusions being configured and dimensioned to be received between adjacent ribs for holding and securing the ribs in place.

4,099,665
RECLOSABLE CARTON WITH TAPERED TOP CLOSURE

Robert M. Bergstein, Cincinnati, Ohio, assignor to The Bergstein Packaging Trust, Middletown, Ohio

Filed Feb. 22, 1977, Ser. No. 770,640
Int. Cl.[2] B65D 5/56
U.S. Cl. 220—403 3 Claims



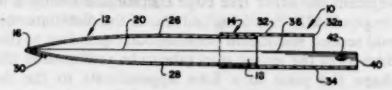
1. A prelined reclosable carton formed from a knocked-down tubular carton structure having opposing side and end walls with bottom closure flaps at their lowermost ends, a tubular liner in said carton having its mouth extending upwardly beyond the uppermost ends of said side and end walls, said liner being adhered to the opposing side walls of said carton as an incident of forming the knocked-down carton structure, said carton end walls being scored to define sets of bellows-like gussets extending downwardly from the uppermost edges of said end walls, each of said sets of gussets being defined by a centrally disposed vertical line of fold extending downwardly from the upper edge of the end wall in which it is formed, said vertical line of fold terminating at its bottom end in a pair of diagonally disposed lines of fold extending downwardly and outwardly to the opposite side edges of the end wall, said lines of fold defining an opposing pair of gussets connected to each other along said vertical line of fold, said sets of gussets, upon erection of said carton body walls relative to each other, being displaceable inwardly between said opposing side walls along said centrally disposed vertical lines of fold and said diagonally disposed lines of fold so as to cause the upper portions of the opposing side walls to flex inwardly relative to each other to form a tapered top closure in which the uppermost edges of said side walls are juxtaposed, said centrally disposed lines of fold, upon inward displacement of said gussets, defining folding edges acting to fold inwardly the portions of the liner mouth contacted thereby to form pleats lying between the opposite sides of the liner mouth, the opposite sides of the liner mouth being concurrently flattened by the upper ends of the side walls as they are flexed inwardly and juxtaposed, with the pleats engaged between the opposite sides of the flattened liner mouth, thereby automatically forming a neatly folded liner mouth as an incident of closing said carton, a closure flap hingedly connected to the upper edge of one of said side walls, said closure flap being infoldable over the uppermost edge of the other of said side walls, whereby as the said closure flap is infolded, the flattened and pleated liner mouth also will be folded over the upper edge of said other side wall, and means for releasably maintaining said closure flap in its folded over position, whereby the mouth of the liner is automatically folded and maintained in its folded condition to form a tight closure for the carton.

4,099,666
COMPOSITE BAG FOR HARD CRUSTED BAKERY PRODUCTS

Theodore W. Welles, 20849 Halworth Rd., Shaker Heights, Ohio 44122

Filed Jun. 27, 1977, Ser. No. 810,300
Int. Cl.[2] B65D 33/16
U.S. Cl. 229—62 13 Claims

1. A pre-formed composite bag for crusted bread products comprising, a first bag portion of paper material having opposite ends and a single longitudinal seam between said ends, portions of the material at one of said ends being secured together to close said one end, and a second bag portion defined by first and second films of plastic material having inner and outer ends and having corresponding opposite side edges longitudinally sealed together providing a pair of parallel longitudinal seams between said inner and outer ends, the other

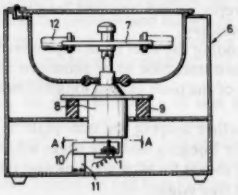


of said opposite ends of said first bag portion being longitudinally received between said inner ends of said films and secured thereto laterally between said pair of seams, and said outer ends of said films providing an opening into said composite bag constrictable to completely enclose an article in said bag.

4,099,667
APPARATUS FOR PREVENTING VIBRATION IN A CENTRIFUGAL SEPARATOR

Tadahiro Uchida, Sayama, Japan, assignor to Kabushiki Kaisha Kubota Seisakusho, Tokyo, Japan

Filed Feb. 17, 1977, Ser. No. 769,718
Claims priority, application Japan, Jul. 9, 1976, 51-90450
Int. Cl.[2] B04B 9/02
U.S. Cl. 233—24 9 Claims



1. In a centrifugal separator having an upright electric motor resiliently supported in a casing and adapted to drive a rotor in rotation, an improvement comprising vibration sensitive means coupled to the motor to control energization thereof, and means supporting said vibration sensitive means in pressure contact with said motor such that if said motor undergoes excessive vibration, said vibration sensitive means deactivates the motor, said means supporting said vibration sensitive means comprising a resilient arm carrying said vibration sensitive means, said motor comprising a casing, said arm being in lateral pressure contact with said casing to respond to radial vibration of the casing of the motor and thereby transmit only such radial vibration to said vibration sensitive means.

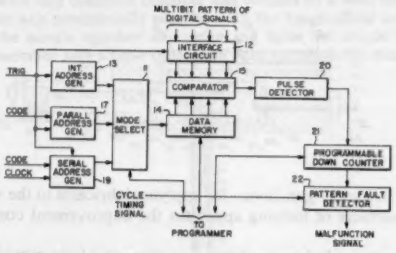
4,099,668
MONITORING CIRCUIT

Michal M. Feilchenfeld, Pittsburgh; Kenneth E. Daggett, Monroeville, both of Pa., and Raymond A. Lloyd, Laurel, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 29, 1976, Ser. No. 736,796
Int. Cl.[2] G06F 11/00; G01R 15/12
U.S. Cl. 235—304 5 Claims

1. A monitoring circuit comprising;
(a) input means for accepting multibit digital signals indicative of the operational status of a device being monitored;
(b) digital storage means having stored therein at predetermined address locations a plurality of multibit digital signals having a predetermined relationship to said multibit digital signals indicative of the operational status of the device being monitored;

(c) means for sequentially reading said stored multibit digital signals and for comparing each of said stored multibit digital signals to each of said signals indicative of the operational status of the device being monitored to generate a pulse each time one of said signals indicative of the operational status of the device being monitored is found to be identical to one of said stored multibit digital signals;



(e) counter means responsive to said pulse to generate a digital number indicative of the number of said pulses which occur within a predetermined time period;

(f) fault detector means responsive to said digital number to generate a malfunction signal if said digital number is less than a preselected value.

4,099,669

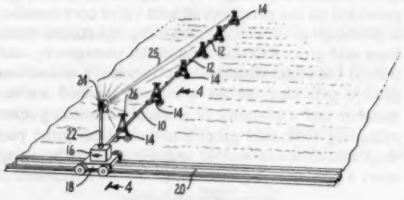
GUIDANCE CONTROL SYSTEM FOR SELF-PROPELLED MOBILE SPRINKLER IRRIGATION SYSTEMS

Dean A. Cortopassi, 11292 N. Alpine Rd., Stockton, Calif. 95205

Filed Dec. 6, 1976, Ser. No. 748,124

Int. Cl.[2] B05B *3/18*

U.S. Cl. 239—11 **11 Claims**



11. A method for controlling the movement of a self-propelled irrigation system in which a supply pipe carrying a plurality of sprinklers is coupled to a source of irrigation water under pressure and is supported above the ground by a plurality of spaced carriages each having propulsion means, said method comprising the steps of:

generating a generally vertical plane of laser energy directed along said supply pipe;

moving the vertical laser plane forward relative to the carriages;

sensing the position of the laser plane relative to the respective carriages and propelling said carriages in response to the sensed position to maintain the carriages in general alignment with the plane.

4,099,670

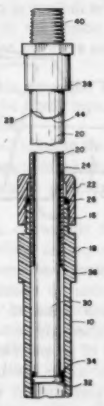
ADJUSTABLE HEIGHT SPRINKLER

Judson C. Cole, 1318 E. 25 St., Tulsa, Okla. 74114, and Eldon W. Morain, 7305 S. 73 E. Ave., Broken Arrow, Okla. 74012

Filed Jan. 24, 1977, Ser. No. 761,798

Int. Cl.[2] B05B *15/10*

U.S. Cl. 239—205 **3 Claims**



1. An adjustable height sprinkling apparatus comprising:

a tubular base member adapted to be buried vertically in the ground having a threaded upper end adjacent the ground surface and having means at the lower end for connection to a source of water pressure;

a tubular extension member telescopically received in said base member;

a coupling member threadably attached to said base member threaded upper end having an opening slidably receiving said extension member and having gasket means for leak-proof locking said extension member to said base member in selectable telescopic relationship;

a tubular pop-up member slidably and telescopically received in said tubular extension, said pop-up member being longer than said extension member and including a flange affixed to the lower end of said pop-up member below the lower end of said extension member, the flange being of outside diameter less than said base member internal diameter the flange serving to limit the upper travel of said pop-up member by engagement with the lower end of said extension member, and the pop-up member having means at the upper end thereof to receive a spray head, the pop-up member being normally downwardly displaced relative to said extension member by gravity and being upwardly displaced by water pressure.

4,099,671

DEVICE FOR CONTROL OF AN AIRCRAFT

Heinrich Leibach, Grafrath-Wildenroth, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Sep. 13, 1976, Ser. No. 722,771

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540537

Int. Cl.[2] B64C *15/04*

U.S. Cl. 239—265.29 **14 Claims**

1. Control apparatus for an aircraft comprising:

a gas control housing disposed downstream of a means for supplying jet propulsion gases thereto,

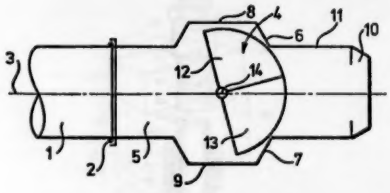
propulsion nozzle means disposed on the downstream end of said control housing in alignment with a longitudinal axis through said control housing,

lateral control outlet means extending laterally from said gas

control housing at respective opposite lateral sides thereof, and

two control valve members, each swingable about an axis running cross-wise to said longitudinal axis,

(i) one of said control valve members being configured and controllable to selectively block totally the flow of propulsion gases to said propulsion nozzle means, and



(ii) said control valve members being configured and controllable together to selectively block totally the flow of propulsion gases to said propulsion nozzle means and simultaneously to selectively block at least partially the flow of propulsion gases to at least one of said lateral control outlet means,

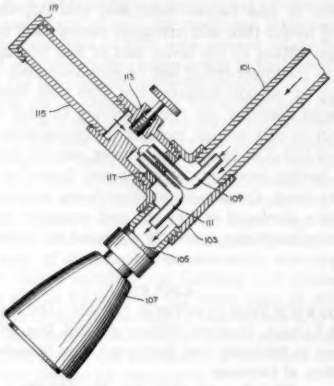
whereby steering of said aircraft may be effected by the selective change in flow direction of said propulsion gases.

4,099,672

SHOWER-HEAD FIXTURE

Ray Albert Sheahan, and Dorothy Marie Sheahan, both of 6160 S. 6th St. W26, Milwaukee, Wis.

Filed Feb. 28, 1977, Ser. No. 772,516
Int. Cl.[2] B05B *7/28*
U.S. Cl. 239—317 **3 Claims**



1. An oil-water mixing device for use in a shower comprising:

a. an oil container for holding an oil supply;

b. first elbow means for directing a portion of supply water into the container from a supply pipe, thereby mixing the oil and the water;

c. second elbow means for returning the mixture from the container to the water stream; and

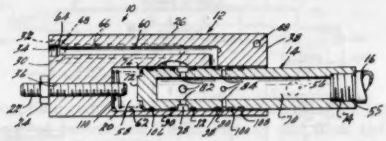
d. valve means between the first and second elbow means and the container for controlling the amount of oil to be mixed with the water.

4,099,673

SPRAY GUN DEVICE

Allan B. Heath, and Eugene E. Wolfe, both of Port Huron, Mich., assignors to Acheson Industries, Inc., Port Huron, Mich.

Filed Jul. 12, 1976, Ser. No. 702,498
Int. Cl.[2] B05B *7/04*
U.S. Cl. 239—415 **23 Claims**



1. In a spray gun device for applying lubricants to the working surfaces of forming apparatus the improvement comprising:

a main body housing having an elongated bore provided in one end thereof;

an elongated valve core member movably disposed within said bore and extending outwardly from said one end of said housing and adapted to selectively control the flow of two or more fluids through said spray gun;

actuating means for selectively moving said valve core member relative to said main body housing;

adjustable means adapted to engage a portion of said valve core member so as to limit the movement of said valve core member in one direction;

at least first and second fluid passageways provided in said main body housing, first and second fluid inlet passageways provided on said valve core member, said valve core member being continuously movable between an off position in which said first and second fluid inlet passageways do not communicate with said first and second fluid passageways thereby preventing the flow of fluids through said spray gun to a first position in which only said first fluid passageway communicates with said first fluid inlet passageway and to a second position in which both said first and second fluid passageways communicate with respective of said first and second fluid inlet passageways;

a single longitudinal fluid outlet passageway provided in said valve core member and communicating with each of said first and second fluid inlet passageways; and

said first fluid inlet passageway comprises an annular groove provided on the periphery of said valve core member and a plurality of inwardly extending apertures extending from said groove to said fluid outlet passageway, and said second fluid inlet passageway comprises a second annular groove provided on the periphery of said valve core member and a plurality of inwardly extending apertures extending from said groove to said fluid outlet passageway, said first and second annular grooves being spaced apart a predetermined distance.

4,099,674

NOZZLE MEMBER FOR A CONTAINER WASHING APPARATUS

Wendell Evert Standley, Lake Forest, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 660,587, Feb. 23, 1976, abandoned.
This application May 26, 1977, Ser. No. 800,777
Int. Cl.[2] A47L *15/00*; B05B *7/00*; B67C *1/00*
U.S. Cl. 239—431 **5 Claims**

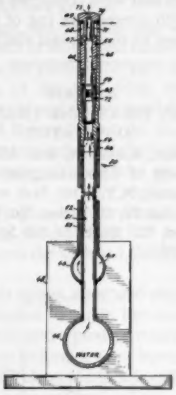
1. A nozzle member for use in a washing apparatus to introduce high velocity fluid and a cleaning material into a container for cleaning purposes comprising:

a first conduit means and second conduit means spaced from first conduit means to provide a passage,

a nozzle head member in fluid-tight communication with

said first and second conduit means defining a common chamber extending along a longitudinal axis of said nozzle member for mixing said fluid and cleaning material,

at least one first annular aperture communicating with said common chamber to the outside of said nozzle head member, said annular aperture having at least one wall extending substantially transverse to the longitudinal axis of said nozzle member and a second aperture communicating with said common chamber and defined by a wall having an axis substantially parallel with the longitudinal axis of the nozzle member and extending from the nozzle head member and to the outside of said nozzle head member



and spaced from said first aperture, said second aperture constructed and arranged to discharge a fluid stream that is essentially parallel to the longitudinal axis of said nozzle member and said first aperture constructed and arranged to discharge a fluid stream that is essentially transverse thereto,

inner and outer pipe members defining said nozzle head member,

said pipe members being internally threaded to each other, and

adjustment means operatively associated with said inner pipe member to afford internal adjustment and locking of said inner pipe member.

4,099,675

SPRINKLER HEAD FOR WATER SPRAY COOLING INSTALLATIONS

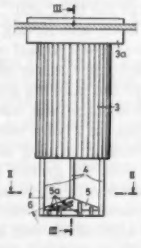
Hans-Jöachim Wohler, Bochum-Dahlhausen, and Walter Ilse, Bochum, both of Germany, assignors to Balcke-Durr AG, Ratingen, Germany

Filed Jul. 26, 1976, Ser. No. 708,630

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1975, 2533021; Jun. 16, 1976, 2626948

Int. Cl.[2] B05B *1/26*

U.S. Cl. 239—498 **18 Claims**



1. A sprinkler head particularly suited for water spray cooling installations, where hot water flows through horizontal water distribution conduits or water distribution channels and is to be sprayed onto heat transfer structures thereunder, as it exits through a plurality of sprinkler heads mounted on a bottom wall of said distribution conduit or distribution channel, the sprinkler head comprising in combination:

a downwardly oriented spray pipe attached to the bottom wall of the distribution conduit or distribution channel and communicating with the inside thereof to serve as an outlet, the spray pipe having a mouth portion at its lower extremity;

at least one spray plate arranged centrally underneath the mouth portion of the spray pipe, so as to face upwardly against the latter; and

means for carrying and holding the spray plate in said position against the impact of an impinging stream of liquid exiting from the mouth portion of the spray pipe; and wherein

the spray plate has an outwardly and downwardly sloping upper surface of which an impinging stream of liquid is deflected and spread into a generally cone-shaped divergent spray pattern; and

the spray plate further has extending through it a plurality of apertures through which a portion of said liquid stream can pass downwardly so as to cover an area which is located centrally within said spray pattern, said apertures being spray distributor slots extending inwardly from the periphery of the spray plate, forming a slot pattern in which groups of parallel, secantially oriented slots follow each other in a regular angular succession, whereby the slots of angularly adjacent slot groups are oriented substantially transversely to each other and the inner extremities of one group of slots are spaced substantially the same distance from the nearest slot of the adjacent group of slots.

4,099,676

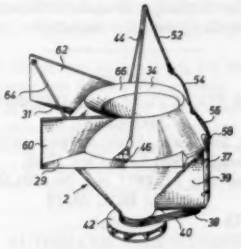
APPARATUS FOR SPREADING FERTILIZER, PLANT KILLER OR SIMILAR AGENTS FROM AN AIRCRAFT

Thore Sterner, and Arne Johansson, both of Borlange, Sweden, assignors to Sterner Aero Aktiebolag, Borlange, Sweden

Filed Jun. 14, 1976, Ser. No. 695,321

Int. Cl.[2] A01C *17/00*

U.S. Cl. 239—687 **6 Claims**



1. Apparatus for spreading granulated agents from an aircraft comprising a container containing agents and being constructed and arranged to be removably attached to an aircraft, said container defining a first opening, rotating dispersion means connected to said container in communication with said first opening for spreading agent to the surrounding area, stabilizing means secured to said container for keeping the container in a predetermined attitude relative to the aircraft including two fins having surfaces of different sizes attached to the rear portion of the container and forming an acute angle with a vertical plane parallel to the direction of flight of the aircraft for keeping the central axis of the container substantially in a predetermined position parallel with the flight direc-

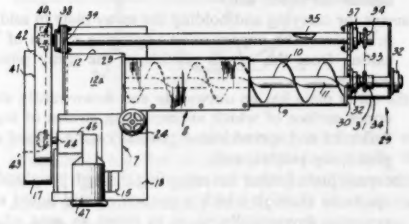
tion of the aircraft when the dispersion device rotates, substantially independent of the amount of agent in the container and the flying speed of the aircraft.

4,099,677

AUGER FEED GRANULATOR

Donald B. DeNoyer, Beloit, Wis., assignor to Sterling, Inc., Milwaukee, Wis.

Filed Dec. 12, 1974, Ser. No. 531,882
Int. Cl.² B02C *13/286*
U.S. Cl. 241—186 A **7 Claims**



1. In an auger feed granulator for conveying and granulating plastic material having a granulator assembly and a conveyor assembly, said conveyor assembly including a trough and an auger, the trough and auger each having inlet and discharge ends, said discharge ends communicating with the granulator assembly, the improvement comprising:

said conveyor assembly being supported from said granulator assembly in a cantilevered manner;

power means being supported from said granulator assembly in a cantilevered manner;

said power means include a jack shaft extending in spaced parallel relation along one side of said trough, and means associated with said granulator assembly comprising a power source coupled in driving relation to said jack shaft;

said power source comprising a motor supported by said granulator assembly;

said power means drivingly connected to said auger through said jack shaft at the inlet end thereof;

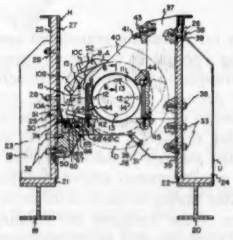
said auger at the discharge end thereof terminating substantially adjacent to the entrance of the granulator assembly, to effect free discharge of material from the conveyor assembly into the granulator assembly.

4,099,678

SHREDDER STRUCTURE AND IMPROVEMENTS THEREIN

John C. Brewer, Salt Lake, Utah, assignor to Garbalizer Machinery Corporation, Salt Lake City, Utah

Filed May 31, 1977, Ser. No. 801,654
Int. Cl.² B02C *18/16*
U.S. Cl. 241—243 **4 Claims**



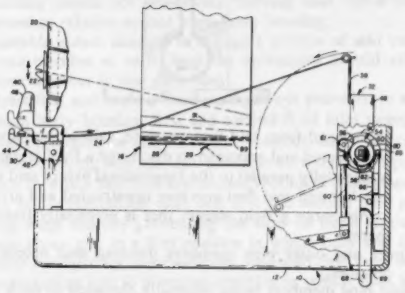
1. A shredder including, in combination, a side plate, a journalled, revolvable shaft disposed parallel to said side plate; a series of mutually-spaced cutter blades mounted on said shaft; a series of stationary cutter bars having upper edges and being fixedly disposed with respect to said side plate; cutter bar segments releasably secured to said cutter bars, respectively, proximate said upper edges and being cooperatively disposed relative to said cutter blades, respectively; a series of webs, transversely positioned relative to said side plate, disposed over portions of respective ones of said cutter bar segments, and having upper declining edges forming with said side plate a constricting travel path for materials progressing toward said cutter bars at uncovered portions of said cutter bar segments, and wherein each of said webs comprises a stationary first web member aligned with a respective one of said cutter bars, and web means apertured to receive said shaft.

4,099,679

DUAL YARN TIE-UP AND TRANSFER TAIL APPARATUS

Joseph R. De Baker, Kingsport, and Albert E. Spaller, Jr., Johnson City, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1977, Ser. No. 817,274
Int. Cl.² B65H *54/02, 54/34*
U.S. Cl. 242—18 PW **16 Claims**



1. Apparatus for tying-up a yarn to and for forming a yarn transfer tail on a yarn package tube that is supported on a rotating mandrel of a yarn winder, the yarn moving continuously from a source of supply to the yarn package tube for engagement with a portion of the surface thereof and away from the tube, as into an air doffer, the portion of said surface to be engaged rotating in the same direction as the direction of yarn movement, the yarn winder having a self-threading yarn traverse guide reciprocating along a path parallelly spaced from the package portion of the yarn package tube, the supported yarn package tube comprising:

(a) a substantially cylindrical body having formed in its external surface adjacent one end thereof a groove defined by a pair of side walls extending into the surface of the cylindrical body and extending at least partly around said cylindrical body in a plane substantially perpendicular to the rotation axis of the tube, and

(b) the cylindrical body also having adjacent the one side wall of the groove closest to said one end of the cylindrical body means defining a corner intersecting said one side wall of the groove and pointing generally in the direction of intended rotation of the tube, which is adapted in rotary winding operations, as a yarn enters the groove in one direction of movement, to snag and deflect a portion of the yarn exiting from the groove around said corner for changing the direction of movement of the exiting yarn portion as said corner rotates with the tube away from where the yarn approaches said surface portion of the tube;

the apparatus comprising:

means for positioning the yarn in engagement with said surface portion of the yarn tube in a partial arch at an initial location along the tube length that is away from and out of contact with the groove and the corner;

said positioning means including a first and second yarn guide means through each of which the yarn is threaded, the first yarn guide means being mounted at a position along the length of one side of the yarn package tube, the position being slighly axially inwardly of alignment with the groove on the yarn package tube and the second yarn guide means being mounted at a position along the length of the other side of the yarn package tube axially inwardly of alignment with said groove;

means for releasing and moving said second yarn guide means along a path of movement relative to said other side of the yarn tube for guiding the yarn sideways along said surface portion of the tube from said initial location toward said groove and corner until the yarn drops into the grooves and the portion of the yarn exiting from the groove becomes snagged and deflected around the corner as the corner rotates with the tube away from where the yarn approaches said surface portion of the tube, and consequently tying-up the yarn to the tube and subsequently snapping and severing the yarn from the yarn moving away from the tube and through the second yarn guide means;

said first yarn guide means, upon said snapping and severing of the yarn, adapted to guide the continuously moving yarn onto the tube into a predetermined number of wraps as the tube rotates to form a waste bunch at a location that is axially inwardly along the tube length from the groove; and

means for releasing and moving said first yarn guide means along a path of movement relative to said one side of the yarn tube axially inwardly from the groove and corner, after formation of the yarn waste bunch, for guiding the continuously moving yarn onto the tube into a predetermined number of spaced helical wraps as the tube rotates, to form a transfer tail at a location that is axially inwardly along the tube length from the waste bunch;

said first yarn guide means adapted as it moves along its path of movement to release the guided yarn for subsequent pick-up by the yarn traverse guide for guiding the yarn as the yarn is thereafter wound on the package portion of the yarn package tube at a location that is axially inwardly from the transfer tail.

4,099,680

WINDER FOR YARN AND THE LIKE

Harry B. Miller, Hopedale, Mass., assignor to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft, Karlsruhe, Fed. Rep. of Germany

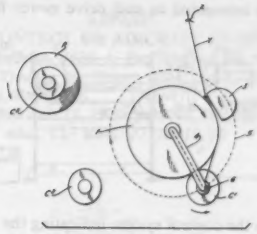
Continuation of Ser. No. 556,556, Mar. 7, 1975, Pat. No. 4,034,923, which is a continuation-in-part of Ser. No. 354,920, Apr. 26, 1973, Pat. No. 3,876,161. This application Feb. 10, 1977, Ser. No. 767,667

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.[2] B65H *54/02, 67/04*

U.S. Cl. 242—18 A **5 Claims**

1. In a winder for yarn and the like, a combination comprising a drive roll having an axis of rotation; at least two rotatable chucks each adapted to have a yarn package formed thereon, said chucks each having an axial end and being movable into and out of driven engagement with said drive roll; a traversing arrangement for traversing a running yarn which is being wound onto one of said chucks, so as to form a yarn package on the latter; and yarn transfer means for effecting automatic transfer of said running yarn from said one chuck upon forming of the yarn package thereon to the empty other chuck while the same is in driven engagement with said drive roll, including an arm on said drive roll turnable about said axis of rotation thereof and having a free end portion arranged to



travel in a path adjacent the axial end of said other chuck and intersecting the axis of rotation of the latter.

4,099,681

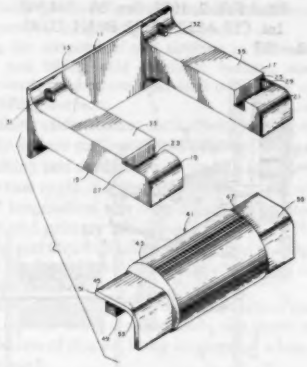
BLADE-TYPE HOLDER FOR PAPER ROLLS

Bennie L. House, P.O. Box 577, Hickory Ridge, Ark. 72347

Filed Mar. 17, 1977, Ser. No. 778,348

Int. Cl.[2] B65H *19/00*

U.S. Cl. 242—55.2 **10 Claims**



1. A holder for a paper roll comprising

a pair of arms each having a length greater than the radius of a full paper roll and having a width about the same as its depth,

said arms having means for mounting the same extending in parallel orientation from a wall surface,

at least one of said arms having a slot near the end thereof extending into the arm from the top, and

a spindle having at an end a blade conforming in shape at least in part to the interior configuration of said slot.

4,099,682

AUTOMATIC WEB WINDER

Alfred L. Benuska, Naperville, Ill., assignor to V.I.P. Engineered Products Corporation, Elk Grove Village, Ill.

Filed Mar. 14, 1977, Ser. No. 777,125

Int. Cl.[2] B65H *19/20, 17/02*

U.S. Cl. 242—56 R **9 Claims**

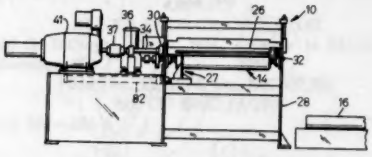
1. In a web winder having a base, a measuring assembly, a feed assembly and a cutting assembly mounted on said base in a series relation, and a control system for synchronizing the operation of the measuring, feed and cutting assemblies, the improvement comprising:

a web roll mandrel assembly mounted on the base in a position to receive the lead end of the web, said assembly including

a slotted mandrel,

means for driving said mandrel to wind the web into a roll of predetermined length, said driving means being rotatable in either direction,

and means connected to said drive motor for providing a



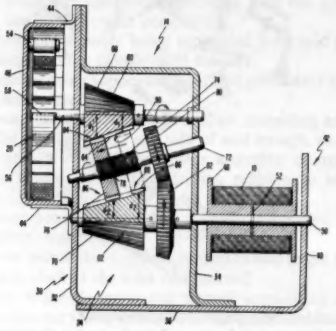
signal to the control system indicating the rotary position of the slot in said mandrel whereby said mandrel can be automatically rotated in either direction to orient the slot in the mandrel to receive the lead end of the web in the shortest angular motion.

4,099,683

CONSTANT PULL SAFETY BELT RETRACTING MECHANISM

Richard C. Stouffer, Auburn Heights, and John Adams, Grosse Pointe Woods, both of Mich., assignors to Allied Chemical Corporation, Morris Township, Morris County County, N.J.

Filed Feb. 2, 1977, Ser. No. 764,945
Int. Cl.[2] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107 **12 Claims**



1. In a vehicle safety system including a safety belt adapted to restrain an occupant in position on a seat, a safety belt constant pull retracting mechanism comprising, in combination:

a housing;

storage means for storing said safety belt, said storage means operative for retracting and protracting said belt;

positive force characteristic biasing means for biasing said storage means for retraction of said belt; and

gear train means for coupling together said biasing means and storage means, said gear train means having a negative coefficient of force transfer characteristic compensating for the positive coefficient of force transfer characteristic of said biasing means, a resultant pull applied to said belt thereby being approximately constant as said belt is protracted;

said gear train means including variable gear ratio means for varying a gear coupling ratio during protraction of said belt and comprising:

(a) first and second cone gears oriented with facing inclined sides thereof parallel to each other and mounted respectively on first and second parallel shafts; and

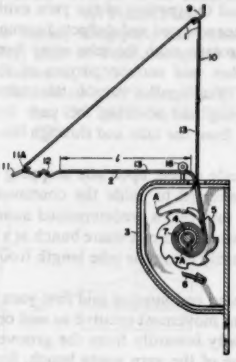
(b) coupling means for coupling together said cone gears at a first, high force transfer gear ratio when said belt is fully retracted, and at a second, lower force transfer gear ratio when said belt is fully protracted, said coupling means comprising a pinion gear mounted on a rod provided between said first and second shafts, said pinion gear meshing with facing sides of said cone gears; a spur gear secured to said rod and a bevel gear secured to said shaft of said second cone gear, said spur and bevel gears being in enmeshment with each other.

4,099,684

SEAT BELT SYSTEM

Mamoru Mori, Okazaki; Jun Yasumatsu, Toyota, and Tatsushi Kubota, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and K. K. Tokai Rika Denki Seisakusho, both of, Japan

Filed Jul. 25, 1977, Ser. No. 818,415
Claims priority, application Japan, Aug. 2, 1976, 51-103419[U]
Int. Cl.[2] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107 **8 Claims**



1. A seat belt retractor system for winding up two seat belts on a single retractor shaft one over the other, comprising:

a base;

a retractor shaft rotatably supported by said base two seat belts coupled said retractor shaft; and

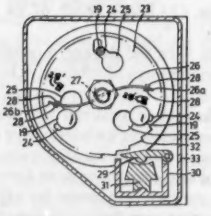
a flexible fastening means provided on both of said seat belts whereby said seat belts are easily fastened together along their length when the seat belts contact each other during retraction and are easily separated when the seat belts are separated during extension.

4,099,685

LOCKING DEVICE IN SAFETY SEAT BELTS FOR VEHICLES

Hannu Olli Paitula, Jarna, Sweden, assignor to Granges Essem Aktiebolag, Vasteras, Sweden

Filed Dec. 7, 1976, Ser. No. 748,393
Claims priority, application Sweden, Sep. 12, 1975, 7513885
Int. Cl.[2] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 B **14 Claims**



1. In a locking device for safety seat belts of vehicles in

which a strap of a seat belt is automatically retracted and wound onto a wind-up shaft when the seat belt is not in use to prevent rapid extension of the strap, the device including a rotatable body unrotatably attached to one end of said shaft, said body having a guiding surface and arranged to rotate with the shaft, stop means positioned outside the rotatable body and fixedly mounted in relation to the shaft, and at least one elongated locking member movable in relation to the rotatable body and positioned between the rotatable body and the stop means, the locking member being movable on the guiding surface on the rotatable body from a radially inner, free portion, in which it does not prevent rotation of the rotatable body, to a radially outer locking position, in which it engages with both the stop means and the rotatable body and, thus, prevents further turning of the rotatable body, the improvement comprising:

inertia means having a periphery and a relatively large inertia, pivotally mounted on said shaft and positioned adjacent to said rotatable body;

a respective slot provided in said inertia means for each said locking member, said slot having an outer portion extending towards said periphery and, at least at its inner portion, forming an angle with a radius passing through the inner end of the slot, a portion of said locking member extending into and being guided thereby, said inner portion of said slot guiding said locking member in its free position and said outer portion of said slot guiding said locking member in its locking position;

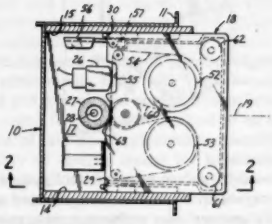
and spring means coupled to said rotatable body and to said inertia means for keeping said body and said inertia means in a determined angular position in relation to one another when said strap is slowly extended and for yielding when said strap is rapidly extended so that said rotatable body and said inertia means change angular position in relation to one another, whereby the locking member is moved in the slot of the inertia means from its free position to its locking position when the strap is rapidly extended.

4,099,686

RECEPTACLE FOR TAPE CARTRIDGE

Ephraim F. Moya, Canoga Park, Calif., assignor to Instrumentation Technology Corp., Northridge, Calif.

Filed Feb. 7, 1977, Ser. No. 766,028
Int. Cl.[2] G03B *1/04*; G11B *15/32, 23/04*
U.S. Cl. 242—198 **12 Claims**



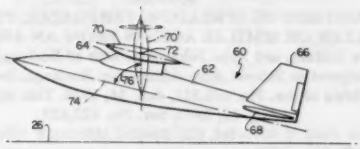
1. A receptacle for receiving a tape cartridge including tape-bearing reels and a pressure wheel for driving the tape, and a first and second axis locating face, said receptacle comprising: a first and a second side wall in part bounding a cavity, said cavity having a first axis extending in the direction of insertion and removal of the cartridge from the receptacle, and a second axis normal to the first axis and also normal to the plane of the cartridge, a second axis locating face carried by each of said side walls, and a first axis locating face carried by the receptacle, whereby the cartridge may be pressed into the cavity and the sets of first and second axis locating faces brought into abutment with one another accurately to align the tape, and bias means exerting forces along both of said axes, whereby to press both the first and second axis locating faces together in sets.

4,099,687

ALL-AXIS CONTROL OF AIRCRAFT IN DEEP STALL

Lawrence T. Roberts, 1634 A Des Moines Rd., Kent, Wash. 98031, and Thomas H. Strom, 605 Tam-O-Shanter Blvd., Williamsburg, Va. 23185

Filed Jul. 22, 1976, Ser. No. 707,789
Int. Cl.[2] B64C *27/28, 19/00*
U.S. Cl. 244—7 R **5 Claims**



1. A method for controlling the stalled descent of a generally conventional airplane having a fuselage with nose and tail, a fixed wing as the primary lifting surface, a rudder at the tail for yaw control, a power system for generating forward thrust substantially parallel to the longitudinal axis of said fuselage, and a generally planar fully tiltable stabilizer surface at said tail for pitch control, comprising the steps of:

reducing the airspeed of said airplane in substantially level flight and tilting said stabilizer surface, leading edge downward, to produce near stall conditions on said primary lifting surface;

further tilting said stabilizer surface with leading edge downward to induce stalling of said primary lifting surface;

further tilting said stabilizer with leading edge downward at an extreme angle of approximately 65° to 80° with respect to said longitudinal axis of said fuselage to produce deep stall of said primary lifting surface;

increasing said thrust of said power system to orient said axis of said fuselage above the horizontal with said nose higher than said tail; and

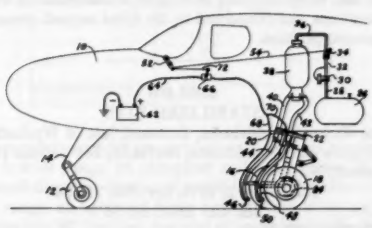
varying said engine thrust to control the rate of descent, said rate of descent being arrested when said thrust is increased and said rate of descent being accelerated when said thrust is decreased.

4,099,688

RUNWAY SANDER

Murray Lawrence Jayne, 1906 NE. River Ct., Jensen Beach, Fla. 33457

Filed Oct. 4, 1978, Ser. No. 729,486
Int. Cl.[2] B64D *47/00*; B60B *39/08*
U.S. Cl. 244—103 R **5 Claims**



2. In combination with an aircraft having an landing wheel, a system carried on the aircraft including a reservoir containing a quantity of gritty aggregate, a source of fluid under pressure, a nozzle portion in communication with the reservoir and positioned to discharge the aggregate in a region to be

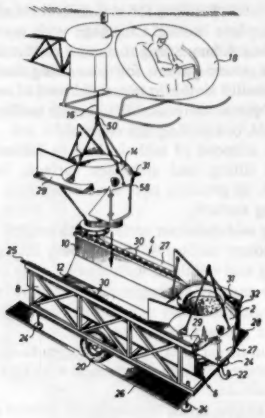
engaged between said landing wheel and a surface with which said wheel is in contact, said source of fluid under pressure being separate from said reservoir containing said gritty aggregate, valve means controlling the flow of fluid from said source of fluid under pressure and a conduit connecting said valve means with said reservoir, said reservoir including an inlet having a coupling means for said conduit, and having a frangible diaphragm spaced from said conduit and positioned to seal said inlet against entrance of extraneous matter, and adapted to be ruptured by the pressure of fluid coming from said conduit.

4,099,689

METHOD OF SPREADING FERTILIZER, PLANT KILLER OR SIMILAR AGENTS FROM AN AIRCRAFT

Thore Sterner, and Arne Johansson, both of Borlange, Sweden, assignors to Sterner Aero Aktiebolag, Borlange, Sweden

Division of Ser. No. 695,321, Jun. 14, 1976. This application Aug. 10, 1977, Ser. No. 823,437
Int. Cl.[2] B64D *1/18*
U.S. Cl. 244—136 **3 Claims**



1. A method of raising, lowering and moving by helicopter while in flight transport containers from and to a mobile station, wherein a first container filled with transport goods, which in the station is carried in a forward position in the direction of helicopter flight, is first connected to the helicopter and lifted by it from the station, whereafter a second container carried in a rear position in the direction of helicopter flight is moved in the station on carrying means attached to the station to the said forward position, whereafter the first container previously emptied of transport goods is set down by the helicopter in the station in the said rear position or in a position behind this, whereafter the helicopter is disconnected from the first container and connected to the filled second container in the forward position.

4,099,690

STABILIZED KITE

Charles Richard Mendelsohn, deceased, late of Wyckoff, N.J., by Phyllis Jane Mendelsohn, executrix, 736 Terrace Heights, Wyckoff, N.J. 07481

Filed Aug. 2, 1976, Ser. No. 710,544
Int. Cl.[2] B64C *31/06*
U.S. Cl. 244—153 R **13 Claims**

1. A kite comprising:

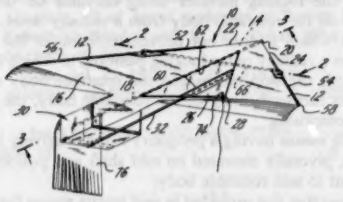
a wing portion of flexible material disposed symmetrically about a central line;

wing spreading means structurally associated with said wing portion for providing equal and opposite extension forces operable at said central line; and

stabilizer means for stabilizing the kite during flight further comprising;

a substantially triangular keel portion depending from and structurally associated with the lower surface of said wing portion being attached thereto along one end of said central line, said wing portion and said keel portion during flight being substantially perpendicular;

at least one apertured elevating cell through which air is



drawn while the kite is in flight each said cell having two side walls and upper and lower walls, each said cell depending from and structurally associated with the lower surface of said wing portion along the other end of said central line; and

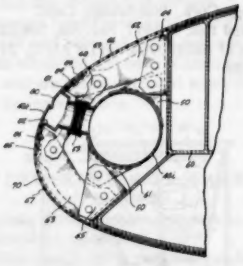
stabilizer strut means for holding open each said apertured elevating cell during flight being disposed between said keep portion and said lower wall of each said apertured elevating cell.

4,099,691

BOUNDARY LAYER CONTROL SYSTEM FOR AIRCRAFT

Everts W. Swanson, Edmonds, and Marvin D. Wehrman, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 13, 1976, Ser. No. 749,624
Int. Cl.[2] B64C *21/04*
U.S. Cl. 244—207 **1 Claim**



1. An improved boundary layer control system for aircraft for injecting controlled air, whose temperature and pressure are substantially greater than ambient temperature and pressure and which is obtained from a controllable air source, into a boundary layer region adjacent to an airfoil surface of the aircraft from a plurality of points located spanwise along at least a portion of a surface of a member of the aircraft forward of the airfoil surface, said system comprising:

(a) means defining a slot in the forward surface, said slot extending spanwise along the forward surface substantially coextensive with said portion of the forward surface from which controlled air is to be injected;

(b) a plurality of longitudinally-extending manifolds for conducting air from the controllable source thereof to points along the forward surface, each said manifold having an open inboard end and an open outboard end;

(c) means mounting said plurality of manifolds in successive

spanwise arrangement within the aircraft member, said mounting means including a plurality of first supports, each of said first supports securing, in a fixed position, one of said plurality of said manifolds to the aircraft member in proximity to a respective inboard end of said one manifold, and a plurality of second supports, each of said second supports securing one of said plurality of manifolds to the aircraft member in proximity to a respective outboard end of said one manifold so that each said one manifold can expand longitudinally and thus in a spanwise direction along the aircraft member;

(d) first means interconnecting said inboard end of the most inboard one of said plurality of manifolds with the controllable air source;

(e) a plurality of second means interconnecting the inboard end of each successive outboard one of said plurality of manifolds with the outboard end of an adjacent inboard one of said plurality of manifolds, each said second means being capable of compression upon longitudinal expansion of said manifolds;

(f) a plurality of longitudinally-extending nozzle plenums, at least one said nozzle plenum being associated with a corresponding one of said plurality of manifolds, each said nozzle plenum having a closed inboard end and a closed outboard end, and further having a front wall member configured to fit into said slot and having located therealong a plurality of apertures arranged to inject air into the boundary layer region, each said nozzle plenum also having an upper tongue and a lower tongue both extending longitudinally therealong from said inboard end to said outboard end;

(g) a plurality of third means interconnecting each nozzle plenum with and supporting each nozzle plenum from a corresponding one of said plurality of manifolds so that said plurality of nozzle plenums are located within the aircraft member and in successive spanwise arrangement therealong, each said third means including first and second feeder ducts respectively located in proximity to said inboard and said outboard ends of each said nozzle plenum, said first and said second feeder ducts being capable of permitting relative longitudinal movement between said nozzle plenum and said corresponding one of said plurality of manifolds, each said third means further including a third feeder duct located intermediate said first and said second feeder ducts;

(h) means within the aircraft member defining upper and lower, longitudinal grooves respectively extending above and below and both adjacent to said slot and receiving said upper and lower tongues of said plurality of said nozzle plenums for permitting said nozzle plenums to move longitudinally relative to the aircraft member and for maintaining said front wall member of each said nozzle plenum substantially flush with the forward surface, the outboard end of each said nozzle plenum being adjacent to and separated from the inboard end of an adjacent, outboard one of said nozzle plenums in assembly; and

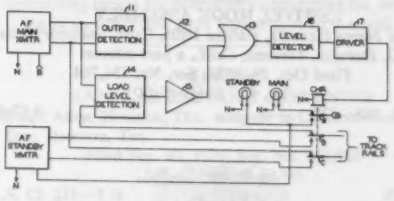
(i) a plurality of sealing means for substantially blocking airflow through said slot between adjacent nozzle plenums, each said sealing means comprising: an upper plate and a lower plate secured to said front wall member at the outboard end of each said nozzle plenum and respectively above and below said apertures therein, said upper and lower plates extending over the inboard end of the front wall member of the adjacent, outboard one of the nozzle plenums and being configured to permit airflow from the plurality of apertures in said adjacent, outboard one of said nozzle plenums upon relative longitudinal movement of said adjacent nozzle plenums; and, flexible means located within said aircraft member and having a longitudinal dimension sufficient to cover the outboard and inboard ends of adjacent nozzle plenums and the separation therebetween, said flexible means being secured to the aircraft member at points in proximity to said outboard and inboard ends of adjacent nozzle plenums.

4,099,692

TRANSFER APPARATUS FOR ENERGY SOURCES

Dick J. Kolkman, Gibsonia, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Apr. 14, 1977, Ser. No. 787,659
Int. Cl.² H02J 9/06
U.S. Cl. 246—34 CT **10 Claims**



1. Transfer apparatus for shifting between a main and a standby energy source for supplying a variable load network, comprising in combination,

(a) a first monitoring means coupled to said main source for detecting the unloaded output and responsive thereto for producing a first operational signal when that unloaded output exceeds a predetermined operating level,

(b) a second monitoring means coupled between said main source and said load network for detecting the output of said main source when said network is heavily loaded and responsive to the detection of at least a preselected operating level of said main source for producing a second operational signal,

(c) circuit means coupled to said first and said second monitoring means and responsive to an operational signal from either for producing a source operating indication signal, and

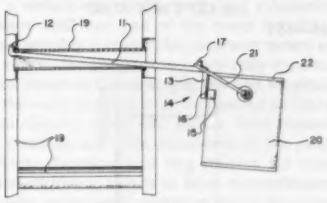
(d) a registry means coupled for registering an operating indication signal received from said circuit means and controlling the source connections to said load network for connecting said main source to said load network when an operating indication signal is registered and transferring said connections to said standby source in the absence of a registered signal.

4,099,693

CONTAINER SUPPORT

Ellis L. Blann, 213 Oak Leaf Dr., Wilmington, N.C. 28401

Filed Oct. 22, 1976, Ser. No. 734,825
Int. Cl.² E06C 7/14
U.S. Cl. 248—210 **6 Claims**



1. A container support comprising: an aluminum type ladder having hollow rungs; an elongated rod-like member of relatively small diameter compared to the interior diameter of said hollow rungs; an upturned hook portion bent at an angle of approximately 90° forming one end of said elongated member and adapted to pass through a hollow rung of said ladder; a downturned bracket portion forming the end of said elongated portion opposite said hook portion whereby a Z-shaped member is provided; a bail engaging member provided on said elongated portion adjacent said bracket portion; and a container side engaging means provided adjacent the end of said

bracket portion opposite said elongated member whereby a container support is provided for use in conjunction with said aluminum type ladder wherein the weight of said container on one end of said support will cause a positive locking effect between the opposite 90° upturned end portion and said ladder.

4,099,694

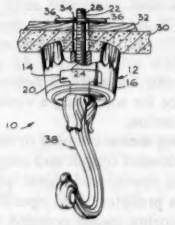
SWIVEL HOOK ASSEMBLY

Howard James Horwitz, Hidden Hills, Calif., assignor to Spencer G. Horwitz, Tarzana, Calif., a part interest

Filed Oct. 29, 1976, Ser. No. 736,764

Int. Cl.[2] F16B *45/00*

U.S. Cl. 248—339 **9 Claims**



1. An improved swivel hook assembly, said assembly comprising, in combination:

a. a housing having

1. a configured entry port extending into the interior thereof and adapted to receive a swivel hook hanger, and

2. mounting means for fixedly mounting said housing to an extended support surface;

b. a swivel hook having an arcuate lower article-supporting hook portion and an upper configured hook hanger adapted to pass through said entry port, said upper hanger being releasably rotatably contained in a fixed location within said housing, said hook being releasably securable against rotation; and,

c. a closure removably received in said entry port and being movable radially relative to the axis of rotation of said swivel hook into and out of port-closing position.

4,099,695

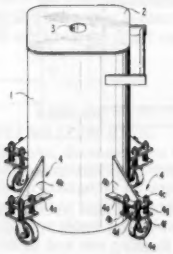
TRAILER SAFETY STAND

Robert C. Shinn, Jr., Hainesport, N.J., assignor to Hollyford Enterprises, Inc., Hainesport, N.J.

Filed Dec. 11, 1975, Ser. No. 639,595

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—351 **3 Claims**



1. A mobile safety stand for temporarily supporting a conventional trailer having a king-pin and landing gear comprising, a pedestal, wheel means mounted on the lower end of said pedestal, a handle connected to said pedestal whereby the pedestal is manually movable to a position under the nose portion of a trailer, a top wall integrally connected to the upper end of the pedestal, an unobstructed recess provided in said top wall for freely receiving and releasing the trailer king-pin in a substantial vertical direction, said recess aligning the trailer king-pin with the top wall of the pedestal, whereby the nose portion of the trailer is supported on the top wall of the pedestal when the trailer landing gear is elevated, and a lubricant contained within said recess whereby the king-pin becomes lubricated while seated therein to thereby facilitate its connection with a tractor fifth wheel when subsequently connected thereto.

4,099,696

SUPPORT APPARATUS

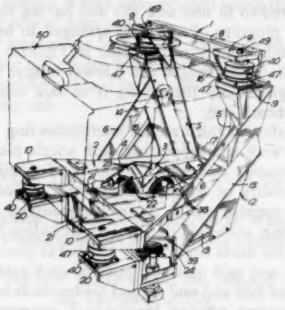
Edward James Toome, Maidstone, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Feb. 25, 1977, Ser. No. 771,902

Claims priority, application United Kingdom, Mar. 10, 1976, 9610/76

Int. Cl.[2] F16F *15/04*

U.S. Cl. 248—358 R **10 Claims**



1. Apparatus for supporting a first structure on a second structure so that relative movement between the two structures is permitted in three mutually perpendicular directions only, comprising:

(a) a first structure;

(b) a second structure on which the first structure is supported;

(c) three flexible shafts connected between the first structure and the second structure and mutually inclined so that their axes of torsional restraint intersect at a position at or relatively close to the centre of mass of the first structure and a load carried by the first structure; and

(d) damping means comprising at least three damping units connected between the first and second structures to provide a vibration and shock isolating arrangement and arranged in a common plane which includes the centre of mass of the first structure and a load carried by the first structure.

4,099,697

TILTING POST SUPPORTED SEAT BIASED TO AN UPRIGHT POSITION

Alfred Von Schuckmann, Nordstr. 32a, Haan, Germany (5657)

Filed Oct. 1, 1976, Ser. No. 728,541

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1975, 7531129[]; Sep. 18, 1976, 2642112

Int. Cl.[2] A47C *3/18*

U.S. Cl. 248—385 **11 Claims**

1. A seat comprising:

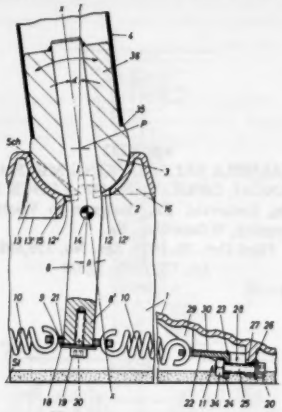
a base member;

a post member extending generally upwardly from said base member;

a ball joint interconnecting said members for tilting movement of said post member relative to said base member;

a seating surface formed on said post; and

a star-like array of tension springs engaging said post member and anchored to said base member for resisting tilting movements of said post member and biasing same into a normal generally upright position, said base member comprising a hollow support formed with a ball joint socket,



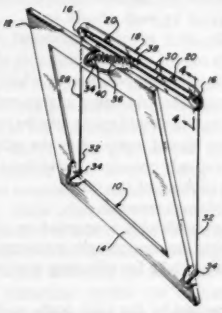
said post member comprising a tubular post having a ball received in said socket and a stem extending below said ball beneath said socket, said socket having a throughgoing bore traversed with clearance by said stem, said springs engaging said stem below said socket, said stem being bent at an obtuse angle below said socket and having a lower end engaged by said springs and disposed substantially vertically below the pivot of said ball joint whereby said springs bias said seating surface into a forwardly tilted normal position.

4,099,698

APPARATUS AND METHOD FOR HANGING AND ORIENTING A WALL HANGING

Henry O. Bell, 3758 E. 113th Ave., Thornton, Colo. 80233

Filed Dec. 10, 1976, Ser. No. 749,414
Int. Cl.[2] A47G *1/16*
U.S. Cl. 248—493 **20 Claims**



1. Apparatus for attaching a wall hanging having a marginal border area to a wall surface, comprising:

a pair of knob members;

means for mounting said knob members at the wall surface generally in an outward protruding and laterally spaced apart relation;

suspension means for suspending the wall hanging at a lower marginal border area from said pair of knob members, said suspension means comprising flexible cable means for encircling said pair of knob members collectively in at least one complete and continuous loop; and

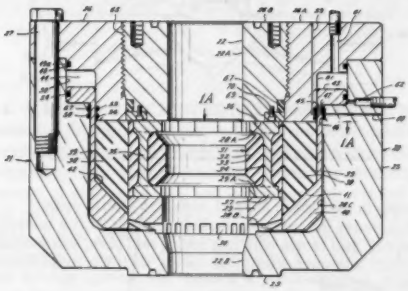
connecting means for operatively connecting the wall hanging at an upper marginal border area to the wall surface.

4,099,699

ANNULAR BLOWOUT PREVENTER

Herbert Allen, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Sep. 10, 1976, Ser. No. 721,968
Int. Cl.[2] E21B *33/06*
U.S. Cl. 251—1 B **19 Claims**



1. An annular blowout preventer, comprising a housing having a bore extending longitudinally therethrough and an annular recess about the bore, a packer comprising an annulus of resilient material mounted in the recess for movement between an expanded position to open the bore and a constricted position to seal about a pipe in the bore or upon itself, another annulus of resilient material surrounding the packer within the recess for moving the packer from expanded to constricted position upon constriction of the inner circumference of the outer annulus, said other annulus having a lower modulus of elasticity than that of the resilient material of the packer annulus, said housing having a cylinder means therein and guideway means connecting the cylinder means with the recess, piston means longitudinally reciprocable within the cylinder means, means for selectively admitting and exhausting operating fluid to and from the cylinder means on opposite sides of the piston means so as to reciprocate the piston means, a ring having a surface engageable with and substantially radially coextensive with one end of the outer annulus, and means extending sealably through the guideway means and connecting the ring to the piston means, whereby upon movement of the piston means in one direction, the ring longitudinally compresses the outer annulus so as to constrict its inner circumference and thereby move said packer from expanded to constricted position, and upon movement of the piston means in the opposite direction, said ring relieves the compression in said outer annulus to permit its inner circumference to expand and thereby permit said packer to move from constricted to expanded position.

4,099,700

FLOW CONTROL DEVICE FOR FLUIDS FLOWING IN A CLOSED CONDUIT

Wen Young, 20228 Valerio, Canoga Park, Calif. 91306

Filed Feb. 16, 1977, Ser. No. 769,181
Int. Cl.[2] F16L *55/44*
U.S. Cl. 251—7 **6 Claims**

1. A flow control device for fluids flowing in a closed channel, comprising:

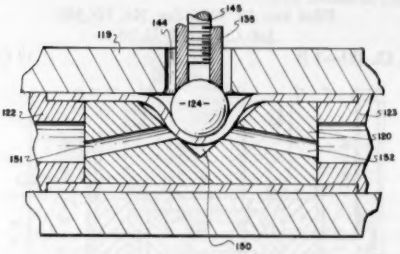
a valve body adapted to be interposed in said closed channel and pierced by a cylindrical bore forming a portion of the channel;

a lateral orifice in said valve body, open to one face thereof and terminating in said bore, with the axis of said orifice orthogonal to said bore;

a cylindrical anvil of smaller diameter than said bore, inserted coaxially thereinto;

a seal tube of flexible elastomeric material, intermediate between said anvil and said bore and in sealing contact with both;

retaining means for locating said anvil and said seal tube in said valve body;



a recess in said anvil, aligned with said lateral orifice;

orifice means in said anvil, including a first orifice interconnecting said recess with one end of said bore, and a second orifice interconnecting said recess with the other end of the bore; and

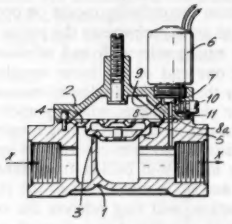
a ball, reciprocable in said lateral orifice, for entraining said seal tube inwardly against said anvil, whereby said seal tube may be distended into said recess and into sealing relationship with respect to said orifice means issuing into said recess, thereby reversibly increasing the restriction in said flow channel.

4,099,701

SOLENOID-CONTROLLED DIAPHRAGM VALVES

Leopold Benjamin Berger, 151 B. Dereh Hayam, Haifa, Israel

Filed Mar. 12, 1976, Ser. No. 666,398
Claims priority, application Israel, Mar. 18, 1975, 46857
Int. Cl.[2] F16K *31/40, 31/385*
U.S. Cl. 251—30 **6 Claims**



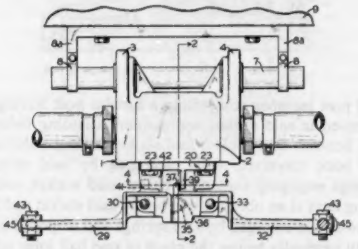
1. In a diaphragm controlled solenoid valve having housing means defined, in part, by a bonnet including an internal conical wall surface, an elastic diaphragm supported along its periphery between the bonnet and the housing in opposition to the conical wall surface in the bonnet, the diaphragm being adapted to follow the movement of the flow pressure whereby a spring is not required to urge the diaphragm onto the conical wall surface and a small pressure inlet orifice in the diaphragm, the improvement comprising an internal groove elongated uprightly inclined in the internal conical wall surface of the bonnet, at least a portion of said groove being in the same vertical plane as and aligned with the orifice, said groove being at least as wide as the diameter of the orifice so that when the valve is open the diaphragm is supported by the conical wall surface in the bonnet with no support along the portion of the diaphragm that contains the orifice and which overlays said groove whereby the portion of the diaphragm that contains the orifice is stretched and the orifice is stretched and the orifice is enlarged to thereby permit contaminants that are lodged in the orifice to be washed away by the fluid flowing through the valve.

4,099,702

DOUBLE HANDLE SELF-LOCKING MECHANISM FOR MANUAL OPERATION OF A COCK KEY

Fred Temple, Swissvale, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 26, 1976, Ser. No. 735,498
Int. Cl. F16k *35/00*
U.S. Cl. 251—95 **12 Claims**



1. For use with a cock having a body disposed in a fluid pressure conduit and a valve rotatably mounted in the body for rotation between an open position in which flow of fluid under pressure through the conduit is established and a closed position in which flow of fluid under pressure through the conduit is prevented, a self-locking operating mechanism for rotating the valve between its open and closed positions, said self-locking operating mechanism comprising;

a. a member connected to the valve for effecting rotation thereof, said member having a pair of oppositely extending arms, wherein the improvement comprises;

b. a fulcrum carried by each of said arms,

c. a pair of links each pivotally mounted on the fulcrum carried by one of said arms and rockable about its respective fulcrum from a first position, in which said self-locking mechanism locks said valve against rotation to a second position, in which said valve may be rotated from one of said open or closed positions to the other,

d. means so operatively connecting said links that rocking of either effects rocking of the other,

e. at least one fulcrum member,

f. at least one lever slidably supported on said at least one fulcrum member and operatively connected to one of said pair of operating links for effecting rocking and rotation thereof,

g. stop means carried by the cock body, and

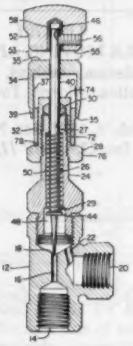
h. means carried by one of said operating links for so cooperating with said stop means as to prevent rotation of said pair of links by said at least one lever prior to the rocking of said pair of links from their first to their second position.

4,099,703

SELF-CLEANING PRECISION METERING VALVE

William Lush, Cheyenne, Wyo., assignor to Ideal-Aerosmith, Inc., Cheyenne, Wyo.

Filed Oct. 12, 1976, Ser. No. 731,523
Int. Cl.[2] F16K *1/38, 1/52*
U.S. Cl. 251—122 9 Claims



1. A valve apparatus, comprising:

an enclosed chamber, an orifice in said chamber through which fluid enters said chamber, and an unrestricted outlet through which fluid exits said chamber into a flow line;

an elongated longitudinally movable valve stem positioned in said chamber with a tapered end portion longitudinally aligned with said orifice;

a main body member partially enclosing said chamber including said orifice and said outlet port and a bonnet member attached to said main body member and enclosing the remainder of said chamber, said bonnet member having a bore through which said valve stem protrudes into said chamber with a portion of said valve stem extending externally of said bonnet member;

bias means associated with said valve stem for normally urging said valve stem toward said orifice;

retraction means connected to said valve stem positioned externally of and longitudinally beyond said bonnet member for applying force to retract said valve stem from said orifice against the pressure of said bias means, said retraction means being operative to forcibly withdraw said valve stem in the direction of removal from said orifice;

a cylindrical sleeve with graduations on a portion of its external surface, said sleeve being slidably mounted around said bonnet in a manner which limits longitudinal movement while allowing rotational movement of said sleeve in relation to said bonnet such that said graduations can be positioned for optimum viewing; and

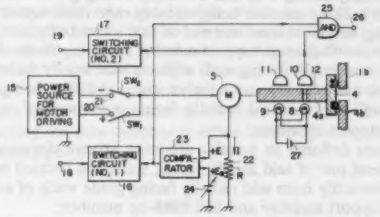
adjustment means attached to said sleeve and associated with said retraction means for adjustably limiting the longitudinal distance said bias means is allowed to move said valve stem toward said orifice by limiting the inwardly directed longitudinal movement of said retraction means, said adjustment means registering on said graduations to indicate the setting of said adjustment means in relation to said sleeve.

4,099,704

VACUUM VALVE APPARATUS

Masahide Okumura, Hachioji; Yoshio Sakitani, Ohi; Yasushi Nakaisumi, and Toshiaki Nakata, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1976, Ser. No. 752,098
Claims priority, application Japan, Dec. 26, 1975, 50-155065
Int. Cl.[2] E16K *31/04*
U.S. Cl. 251—134 10 Claims



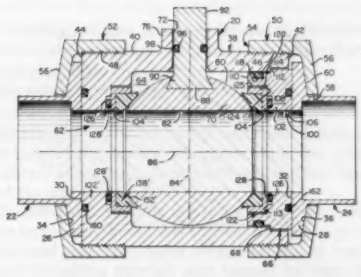
1. A vacuum valve apparatus comprising a valve head, a motor for driving said valve head, and means for confirming complete closure of said valve head, said means for confirming comprising first signal generating means for detecting the position of said valve head and generating a first signal when said valve head is situated within a predetermined valve-closed range, second signal generating means for detecting the driving current of said motor and generating a second signal when said driving current has reached a predetermined level, and third signal generating means for generating a third signal only when both of said first and second signals are generated.

4,099,705

END ENTRY BALL VALVE WITH SEAL WEAR COMPENSATION AND FORCE ISOLATED SEAL

Gary L. Runyan, Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,795
Int. Cl.[2] F16K *5/06*
U.S. Cl. 251—171 8 Claims



1. An end entry ball valve assembly comprising:

valve body means presenting first and second open ends and operable to be connected in fluid communicating relationship to conduit means;

said valve body means including a valve chamber between said first and second ends and a stem receiving passage communicating with said valve chamber;

valve ball means positioned in said valve chamber and operable to rotate between a flow permitting position and a flow blocking position therein;

stem means extending through said stem receiving passage and engageable with said valve ball means to rotate said

valve ball means between said flow permitting and flow blocking positions;

the opening of at least one end of said valve body means being sufficiently enlarged for insertion of said valve ball means into said valve chamber;

bifurcated seal carrier means received in said at least one end of said valve body means and including an annular seal support member and a back-up member;

said annular seal support member carrying an annular seal engaged with said valve ball member and including an axially facing wall and a radially facing guide wall;

said back-up member being slidably receivable in said opening of said at least one end of said valve body means and presenting a seal support member receiving recess defined by an axially facing wall adjacent said axially facing wall of said seal support member and a radially facing guide wall adjacent said radially facing guide wall of said seal support member;

means defining an annular retaining groove disposed in at least one of said axially facing walls and located radially inwardly from said radially facing guide walls of said seal support member and said back-up member;

annular, resilient biasing and sealing means, disposed in said groove in axially compressed condition, for generally axially biasing said seal support member and the seal carried thereby toward said valve ball means and for sealing against flow between said axially facing walls of said annular seal support member and said back-up member; and

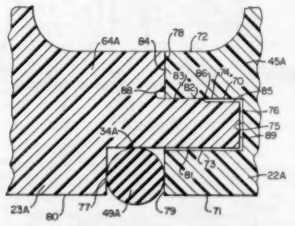
the radial dimension of said radially facing wall of said receiving recess being greater than the outer radial dimension of said seal support member to define limited radial clearance therebetween providing for limited radial centering movement of said seal support member in said receiving recess without direct compressive resistance by said resilient biasing and sealing means.

4,099,706

VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Everett T. Steele, Jr., and Marvin P. Weaver, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 9, 1976, Ser. No. 748,860
Int. Cl.² F16K *27/04*
U.S. Cl. 251—367 **24 Claims**



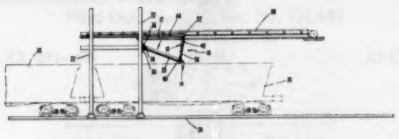
1. In a valve construction having a first housing means provided with an internal chamber therein and inwardly directed shoulder projecting into said chamber at one end thereof and defining a first valve seat on one side thereof, and a second housing means being secured to said first housing means and having a chamber aligned with said chamber of said first housing means, said second housing means having an inwardly directed shoulder projecting into its respective chamber at one end thereof, said first valve seat comprising a resilient annular member disposed against said one side of said shoulder of said first housing means and against an adjacent side of said shoulder of said second housing means while projecting inwardly beyond said shoulders, the improvement wherein one of said housing means has an annular groove in the shoulder thereof inboard of the inner and outer peripheries thereof, the other of said housing means having an annular tongue projecting from the shoulder thereof inboard of the inner and outer peripheries thereof and having an inner annular side and an outer annular side spaced from each other by an end surface of said tongue, said tongue having said inner side thereof engaging the outer periphery of said resilient annular member, said tongue being received in said groove and being ultrasonically welded substantially only on said outer annular side thereof to the housing means having said groove whereby the resulting weld area is isolated from said resilient annular member by said end surface and said inner annular side of said tongue.

4,099,707

VEHICLE MOVING APPARATUS

George Bernard Anderson, Ashland, Ky., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Feb. 3, 1977, Ser. No. 765,313
Int. Cl.² B66F *11/00*
U.S. Cl. 254—35 **7 Claims**



1. Vehicle moving apparatus for moving one or more railroad cars having side walls along a predetermined path, comprising:

support means fixedly dispoed at an elevation which is higher than the upper surface of the car;

first hydraulic cylinder means mounted at one end thereof upon said support means and extensible and retractable in a plane parallel to said railroad tracks for controlling the movement of said cars along said tracks;

second hydraulic cylinder clamping means secured to the other end of said first cylinder means and being extensible and retractable in a plane disposed transverse to said tracks for engaging said railroad car; and

third hydraulic cylinder means secured at one end thereof to said support means and to said first cylinder means at the other end thereof and extensible and retractable within a vertical plane for controlling the elevation of said first and second hydraulic means relative to said railroad car.

4,099,708

APPARATUS FOR APPLYING GRANULAR REFRACTORY MATERIAL TO SURFACES

John C. Morris, Birmingham; James K. Weidman, Gadsden, and Michael D. Prior, Pell City, all of Ala., assignors to Riverside Clay Company, Pell City, Ala.

Filed Aug. 3, 1977, Ser. No. 821,554
Int. Cl.² B05B *3/00*
U.S. Cl. 266—281 **6 Claims**

1. In apparatus for applying granular refractory material to the interior surfaces of an open top ladle, furnace, or the like,

(a) a pair of generally vertically disposed telescopically related conduits,

(b) means to supply granular refractory material to the upper end of the inner one of said conduits,

(c) means to supply water to the upper end of the outer one of said conduits,

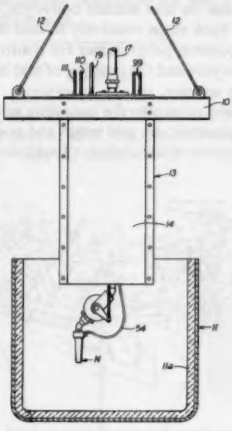
(d) means to support said conduits for substantially 360° simultaneous rotation,

(e) said inner conduit having a lower end portion projecting past the lower end of the outer conduit,

(f) a mixing nozzle on the lower end of the inner conduit in

position to receive and discharge granular material flowing down the inner conduit,

(g) means to supply water from the lower end of the outer conduit to said nozzle,



(h) means mounting said nozzle for angular displacement relative to the longitudinal axis of said conduits, and

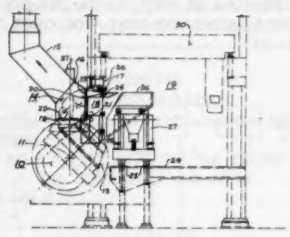
(i) power means operatively connected to the nozzle for displacing the same relative to the longitudinal axis of said conduits.

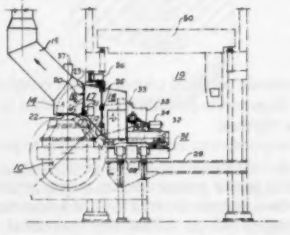
4,099,709

METHOD AND APPARATUS FOR CONTROLLING EMISSIONS FROM OXYGEN STEELMAKING FURNACES

Albert Calderon, 1065 Melrose St., Bowling Green, Ohio 43402

Filed Jan. 12, 1977, Ser. No. 758,599
Int. Cl.² C21C *5/38*
U.S. Cl. 266—44 **12 Claims**





1. In the method of controlling emissions from a basic oxygen steelmaking furnace wherein oxygen is blown onto a charge of metal while the furnace is in a generally upright position with its mouth facing upwardly, and wherein the furnace is rotated to one side of the upright position to bring the mouth to a reclined position on the one side of the upright position for performing certain operations, the improvement comprising the steps of positioning a hood with a first exhaust opening facing the mouth of the furnace while the furnace is in the upright position, providing a second exhaust opening in the hood facing the side of the upright position to which the furnace mouth is rotatable,

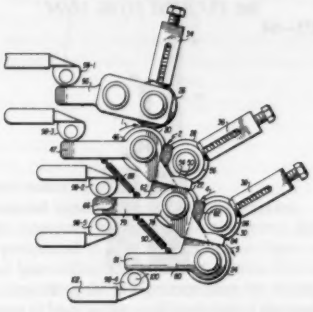
connecting a source of suction with the hood, providing gate means selectively positionable either in a first position closing the second exhaust opening and establishing communication of the first exhaust opening with the source of suction or a second position closing the first exhaust opening and establishing communication of the second exhaust opening with the source of suction, and selectively positioning the gate member in either the first position or the second position.

4,099,710

RADIAL ROLL FOLDER

Harold E. Boyer, Anna, and Jerry V. Trisler, Sidney, both of Ohio, assignors to Graphics Equipment International Corporation, Chicago, Ill.

Filed Aug. 10, 1976, Ser. No. 713,323
Int. Cl.² B65H *45/14*
U.S. Cl. 270—68 A **18 Claims**



10. A folding machine in which the spacing between rollers can be set to accommodate paper stock of various thicknesses, said folding machine comprising:

at least two fixed rollers;

at least one adjustable roller, the position of which is adjustable relative to at least one of said fixed rollers along an arc that is substantially concentric about the other roller to obtain an adjusted spacing between said one fixed roller and the adjustable roller;

an adjustable roller setting means for supporting said adjustable roller and causing said adjustable roller to move away from said one fixed roller along said arc in response to paper travelling through nips formed between said one fixed roller and said adjustable roller said adjustable roller setting means having the further function of automatically and simultaneously maintaining said adjusted spacing.

18. A method for setting the roller spacing between an adjustable roller and first and second fixed rollers in a folding machine, said method comprising the steps of:

biasing said adjustable roller toward said first and second fixed rollers so as to form first and second nips between said adjustable roller and said first and second fixed rollers, but allowing said adjustable roller freedom of movement to move away from said first and second fixed rollers on paths that are substantially concentric with the axes of said first and second fixed rollers;

feeding paper stock through said first nip so as to force said

adjustable roller away from said first fixed roller a distance equal to the thickness of said paper stock;

mounting said adjustable roller on a support mechanism which simultaneously and automatically, with the feeding of said paper stock through said first nip, maintains the position of said adjustable roller relative to said first fixed roller to set the space between said adjustable roller and said first fixed roller, but allowing said adjustable roller freedom of movement away from said second fixed roller on said path that is substantially concentric with said first fixed roller;

feeding said paper stock into said second nip so as to force said adjustable roller away from said second roller on said path that is substantially concentric about said first roller by a distance equal to the thickness of said paper stock in said second nip; and,

mounting said adjustable roller on a support mechanism which simultaneously and automatically, with the feeding of said paper stock through said second nip, maintains the position of said adjustable roller relative to said second fixed roller to set the space between said adjustable roller and said fixed roller.

4,099,711

DIVIDER FOR STACKER MECHANISM

Donald R. Grody, Pittsfield, Mass., and Donald C. Fitzpatrick, Chatham, N.Y., assignors to Lenox Machine Company, Lenox, Mass.

Filed Jan. 12, 1977, Ser. No. 758,764
Int. Cl.[2] B65H *31/20, 31/24*
U.S. Cl. 271—64 **8 Claims**

5. A divider for dividing adjacent stacks of sheets comprising a relatively thin central core, a pair of flexible strips secured to opposite faces of said core and having free end portions extending therebeyond, and flexible hinge means interconnecting said free end portions and urging said free end portions outwardly from said core, said flexible strips and said hinge means being sufficiently thin to be inwardly collapsed below said core and exhibit a combined thickness not greater than said core when so collapsed.

4,099,712

AUTOMATIC SHEET HANDLING APPARATUS

Merrill D. Martin, #2 Mall Ct., Oakland, Calif. 94611

Filed Feb. 25, 1977, Ser. No. 771,845
Int. Cl.[2] B65H *29/58*
U.S. Cl. 271—184 **9 Claims**

1. In an apparatus for handling sheets,

a right angle side conveyor conveying the sheets at an angle from the direction from which the sheets are delivered thereon,

a stacker conveyor for stacking the sheets delivered from said right angle side conveyor,

a side back-up device for aligning sheets on said side conveyor,

means to support said back-up device above said side conveyor facing toward the direction from which the sheets are delivered to said right angle side conveyor,

adjusting means for moving said back-up device toward to and away from said direction of delivery of sheets according to the length of sheets for stopping and aligning the sheets,

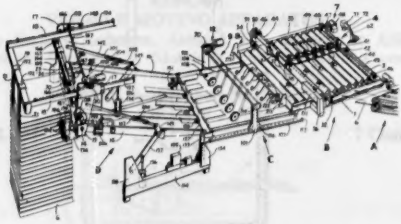
back-stops spaced from the stacker end of the stacker conveyor for stopping and aligning the sheets into a stack,

support means on said stacker conveyor adjustably to support said back stops relatively to said stacker end,

speed and position programmer for controlling the speed of said conveyors and the position of said back-up device and back-stop spacing,

a programmed controller for operating said adjusting means,

pre-setting means to set said speed and position programmer to the respective dimensions of said sheets,



means to translate the pre-setting to said programmed control and to said adjusting means for the adjusting movements of said back-up device and said supports for the back-stops,

means to sense the relative location of said back-up device relatively to said right angle side conveyor,

means to sense the relative location of said back-stops relatively to the stacking end of the stacker conveyor,

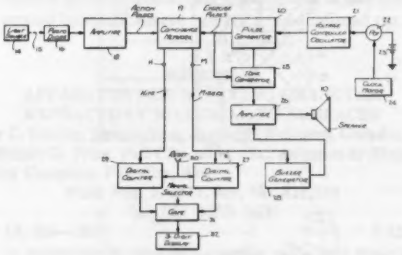
and means to translate the location sensed by said sensing means to said programmed controller for comparing the movement of said adjusting means with the pre-set dimensions.

4,099,713

ELECTRONIC PHYSICAL TRAINER SYSTEM

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Jul. 15, 1977, Ser. No. 816,255
Int. Cl.[2] A63B *21/00;* **G01L** *5/00;* **G08B** *7/00*
U.S. Cl. 272—93 **11 Claims**



1. An electronic physical trainer system comprising:

A. means to generate periodic exercise pulses to establish an exercise rhythm;

B. means responsive to said exercise pulses to produce corresponding tone signals to pace a performer;

C. a position sensor constituted by means projecting a light beam across an exercise area toward a detector to produce action pulses which reflect the movement of the performer as he alternately blocks and clears the beam in seeking to synchronize his movement with that of the tone signals;

D. means to compare the exercise pulses with the action

pulses to produce a hit pulse each time an action pulse overlaps an exercise pulse and to produce a miss pulse in the absence of an overlap;

E. means to separately count the hit and miss pulses during a given exercise regimen; and

F. means to display the respective hit and miss counts to score the performance.

4,099,714

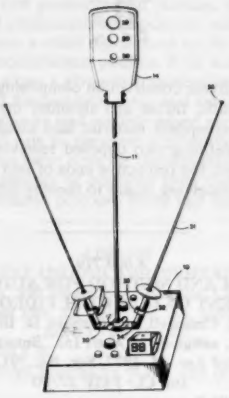
FENCING GAME SET

Charles W. Willis, Rte. 1, Box 273, Rayle, Ga. 30660

Filed Dec. 5, 1977, Ser. No. 857,656

Int. Cl.[2] A63B *69/02*

U.S. Cl. 273—1 F **7 Claims**



1. A fencing game set for two participants comprising:

a. a target having scoring apertures in graduated sizes;

b. a flexible rod supporting said target at upper torso height;

c. a base anchoring said rod;

d. two score tabulating devices mounted to said base; and,

e. a pair of fencing foils for piercing said scoring apertures and knocking said target out of scoring position.

4,099,715

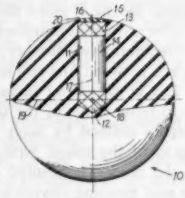
BOWLING BALL

David M. Caplan, Los Alamitos, Calif., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 22, 1975, Ser. No. 570,397

Int. Cl.[2] A63B *37/10, 43/04*

U.S. Cl. 273—63 E **1 Claim**



1. In a bowling ball, an elongated hole formed therein on a diameter of said ball, said hole having a length equal to the radius of said ball plus one half the diameter of said hole, a closure button for the top of said hole, an elongated spacer in said hole, and a weight in said hole positioned at each of the ends of said spacer, said weights being non-metallic and having a specific gravity which is different from the specific gravity of the material of said ball, said spacer and button being non-metallic and having a specific gravity corresponding to the specific gravity of said ball material, and said button, spacer and weights being snug in said hole and filling the same.

4,099,716

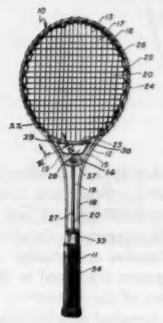
GAME RACKET

Daniel G. Haddad, Worcester, Mass., assignor to Norman S. Blodgett, Worcester, Mass., a part interest

Continuation of Ser. No. 605,167, Aug. 15, 1975, abandoned, which is a continuation of Ser. No. 437,166, Jan. 28, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,703

Int. Cl.[2] A63B *51/12*

U.S. Cl. 273—73 E **8 Claims**



1. A game racket comprising:

a an elongated handle having a hollow interior,

b a frame connected to the handle, the frame defining and being peripheral to a closed geometric figure and being divided into a first and a second portion by two wedge points separating the first portion from the second portion, the frame at least in the neighborhood of the wedge points having inwardly facing grooves, the frame having string points and a dimension perpendicular to the plane of the geometric figure which is larger than the wedge thickness perpendicular to the plane of the geometric figure, the second portion consisting of two generally-parallel legs which pass longitudinally into and through the handle and are fixedly connected to each other by a transverse anchor plate at the end thereof farthest away from the wedge point,

c a wedge having exterior ridges for contacting said grooves in a sliding relationship therewith, said wedge separating the geometric figure into a wide area defined by the wedge and the first portion of the frame, and a narrow area defined by the wedge and the second portion of the frame, the narrow area having a first end and a second end, with the wedge positioned at the first end and the handle position at the second end,

d means including a rod connected at one end to the anchor plate and at the other end by the wedge for causing said ridges to slide within the grooves of said frame and drawing the wedge toward the handle, thereby causing the wedge points to move apart, and

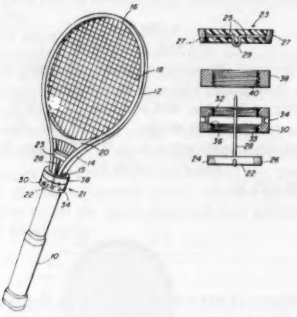
e a string connected between string points on the frame and across the wide area and to the wedge, so that the string becomes more taut as the wedge points move apart and the tension in the string equalizes throughout the racket because of the string points.

4,099,717

ADJUSTABLE TENSION TENNIS RACKET

Bernard R. Sacks, 128 Commonwealth Rd., Cochituate, Mass. 01778

Filed May 11, 1977, Ser. No. 795,995
Int. Cl.[2] A63B 51/12
U.S. Cl. 273—73 E 1 Claim



1. A game racket apparatus wherein said racket includes a head portion for carrying main and cross strings, an open throat portion, a fixed yoke in said open throat portion, a handle portion for gripping by the player and having means for adjusting string tension comprising:

a threaded segment machined in the outer surfaces of said throat portion of the racket;

a tension ring, threaded on a portion of its inner circumferential surface, encircling and engaging said threaded segment of the outside of said throat portion, and being adjustable along the vertical length of the threaded segment of said throat by rotating said tension ring;

a recessed track, cut into the unthreaded portion of the inner circumferential surface of said tension ring;

a tension bar situated in said open throat portion perpendicular to the plane of said racket;

said tension bar having at its ends graphite pads which engage said recessed track;

said tension bar being able to slide freely on the recessed track of said tension ring, to maintain its spatial orientation perpendicular to the plane of said racket and simultaneously to move in a vertical direction along the threaded length of said throat, depending on the direction of the rotation of said tension ring;

an upwardly extending hook integrally formed and coplanar with said tension bar;

a main string retaining bar situated in said throat which receives the looped ends of said main strings and which is capable of vertical movement within the throat area between said yoke and said tension bar;

a downwardly extending eye, integrally formed with said main string retaining bar, which engages said upwardly extending hook;

a threaded locking ring which engages said threaded segment of the throat portion directly above said tension ring and is rotated until it comes into direct contact with said tension ring to lock said tension ring in position;

a plurality of notches cut into the exterior circumferential surface of said tension ring to permit its rotation by a wrench;

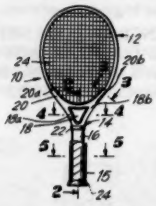
a rotation of said tension ring resulting in a vertical movement of said tension bar and said main string retaining bar, resulting in a change in tension on said strings.

4,099,718

RACQUET FRAME CONSTRUCTION

Nathan Marks, Englewood Cliffs, N.J., assignor to Marcraft Recreation Inc., Garfield, N.Y.

Filed May 17, 1976, Ser. No. 687,432
Int. Cl.[2] A63B 49/02
U.S. Cl. 273—73 C 11 Claims



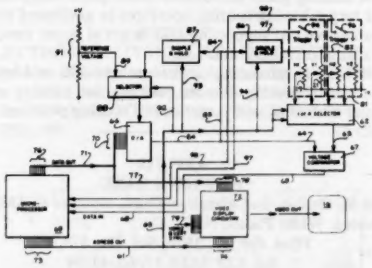
1. A racquet frame construction comprising in combination a one-piece handle, throat and shoulder member consisting essentially of a composite material, said shoulder of said one-piece member defining two opposed receiving means, and a curved metal rim, the respective ends of said metal rim being secured in said receiving means to thereby define said racquet frame.

4,099,719

SYSTEM AND METHOD FOR AUTOMATIC ALIGNMENT OF GUN WITH VIDEO DISPLAY

David W. Dean, Campbell, and Stephen D. Bristow, San Jose, both of Calif., assignors to Atari Inc., Sunnyvale, Calif.

Filed Apr. 28, 1977, Ser. No. 791,833
Int. Cl.[2] F41F 27/00
U.S. Cl. 273—101.2 7 Claims



1. In a video game having a video display and a pointing device supported to be pointed at positions on said display, said display having a predetermined number of positions thereon disposed along an axis between first and second predetermined positions thereof and at which an image can be presented, means responsive to movements of the device to provide an image on said display defined by such movements and for aligning the position of the image with the position of the display at which the device is pointed comprising variable means coupled to said pointing device to provide a variable electric output in response to displacing said pointing device between said first and second predetermined positions on said display, means serving to provide in digital form a first value of the output of said variable means with the pointing device directed at one of said predetermined positions to define a first portion of the operative range of said electric output, and means serving to provide in digital form a second value of said output of said variable means with the pointing device directed at the other of said predetermined positions of said display to

define a second portion of the operative range of said electric output, means defining the difference between said first and second values, and means for subdividing said difference by said predetermined number of positions lying along said axis to associate a proportionate amount of said difference with the displacement of each of said predetermined number of positions from one of said first and second predetermined positions.

6. The method of aligning the position of an image appearing on a video display with the position of the display at which a pointing device is pointed where the position of the image is defined by the orientation of said pointing device and where the display has a predetermined number of positions thereon disposed along an axis between first and second predetermined positions and at which an image can be presented, the steps comprising pointing the device at said first predetermined position of said display, detecting in digital form a value represented by said first predetermined position, pointing said device at a second predetermined position on said display, detecting in digital form a value represented by the displacement of said second predetermined position from said first predetermined position along a given axis, establishing in digital form the value of said displacement along said axis, subdividing said displacement value by said predetermined number of positions lying along said axis to associate a proportionate amount of said displacement value with the displacement of each of said predetermined number of positions from one of said first or second predetermined positions along said axis.

4,099,720

EXPANDING ARROWHEAD

Joseph D. Zeren, 390 Forest Ave., Boulder, Colo. 80302

Filed Feb. 23, 1976, Ser. No. 659,986
Int. Cl.[2] F41B 5/02
U.S. Cl. 273—106.5 B **30 Claims**

1. An arrowhead attachable to the end of an arrow shaft comprising:

an elongated body provided with at least one longitudinally extending slot in its external surface,

means attaching said body to the end of the shaft for coaxial relative movement between said body and the shaft,

at least one blade member having a free end portion and an opposite pivotal end portion with said end portions being joined lengthwise in an angularly displaced relation, said pivotal end portion being insertable in said body slot and including means pivotally securing said pivotal end portion to said body so that said blade is pivotal through an angle greater than 90° around an axis perpendicular to but in offset relation from the general plane of said free end portion, said blade being pivotal in a direction away from the axis of said elongated body between a normally retracted position wherein the length of said free end portion is substantially parallel to the length of said elongated body and an extended position in which the length of said free end portion forms an acute angle with respect to the length of said body and in the direction of the shaft, and

means responsive to said coaxial relative movement for engaging an edge of said blade member pivotal end portion in offset relation to the central axis of said body so as to introduce a rotary force to said blade member outwardly from said body.

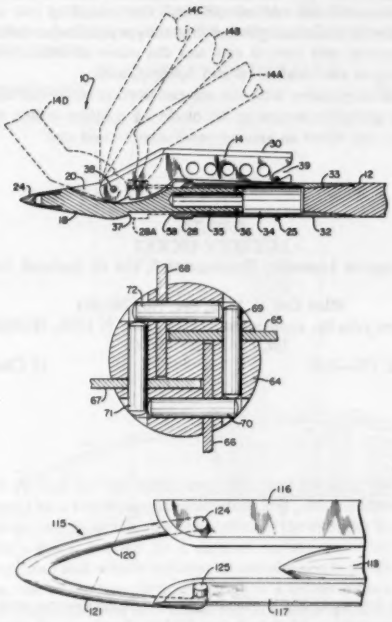
16. An arrowhead attachable to an end of an arrow shaft for impacting a target comprising:

an elongated body having first and second ends with said second end being attachable to the arrow shaft and so that the length of said body is in alignment with the length of the arrow shaft, said body including a plurality of slots extending into said body intermediate of and with the external openings thereof generally perpendicular to said first and second ends,

a plurality of flat blades each having a pair of spaced elongated edges, said blades being pivotally mounted at one end in repective said slots with each said blade having a cutting edge formed on one of said elongated edges and with the opposite said elongated edge being configured at said pivotal mounted end for conforming to the contour of said slots in the region between said pivotal mounting and said elongated body second end, said blades each being pivotable within the associated said slot between a first position wherein said cutting edge is closest to and generally parallel to the central axis of said body and a second position wherein the other said blade elongated edge is blocked from further rotation by said contour region of the associated said slot in proximity to said body second end for holding said blade in an outwardly extended position relative to the external surface of said body,

means extending forwardly of said body and the forwardmost point of said blades when said blades are in said first position for initially contacting the target, said initial contacting means including means for applying at least an initial rotational force to each of said blades in the direction of said second position, and

means yieldably retaining said blades in said first position



and being responsive to said forwardly extending means upon impacting of a target for releasing said blades for rotation within said slots.

21. An arrowhead attachable to an end of an arrow shaft for impacting a target comprising:

an elongated body having first and second ends with said second end being attached to the arrow shaft and so that the length of said body is in alignment with the length of the arrow shaft, said body including a plurality of arcuate slots extending into said body intermediate of and with the external openings thereof generally perpendicular to said first and second ends,

a plurality of flat blades each having a pair of spaced elongated edges, said blades being pivotally mounted at one end in respective said slots with each said blade having a cutting edge formed on one of said elongated edges, said blades each being pivotable within the associated said slot between a first position wherein said cutting edge is clos-

est to and generally parallel to the central axis of said body and a second position wherein the other said blade elongated edge is blocked from further rotation at a location in the associated said slot in proximity to said body second end for holding said blade in an outwardly extended position relative to the external surface of said body, said blades each having a notch opening thereinto from said other elongated edge, and

means yieldably retaining said blades in said first position and being responsive to impacting of a target for releasing said blades for rotation within said slots, said yieldable retaining means including a band interconnectably received in said blade notches.

22. In an arrowhead assembly attachable to the end of an arrow shaft, apparatus for pivotally mounting flat arrowhead blades at one end portion thereof comprising:

a solid elongated body having the central axis thereof aligned with the central axis of the arrow shaft when the arrowhead is attached to the arrow shaft, at least one slot opening into the outer surface of said body with the opening of said slot being generally parallel to but in offset relation to said central axis, said slot extending into said body for a distance greater than the perpendicular spacing between said central axis and the outer surface of said body at the location of said opening, and

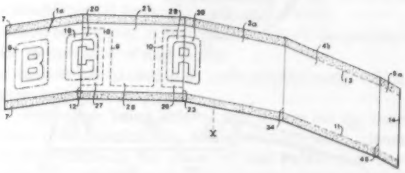
means cooperative with the one end portion of the flat blade for pivotally mounting the blade for rotation within said slot and about an axis perpendicular to said slot.

4,099,721

LOTTERY TICKET

Pehr Ingemar Logander, Rotnäsgatan 6, 654 68 Karlstad, Sweden

Filed Dec. 8, 1976, Ser. No. 748,401
Claims priority, application Sweden, Dec. 9, 1975, 7513835
Int. Cl.[2] B42D *15/00*
U.S. Cl. 273—139 **12 Claims**



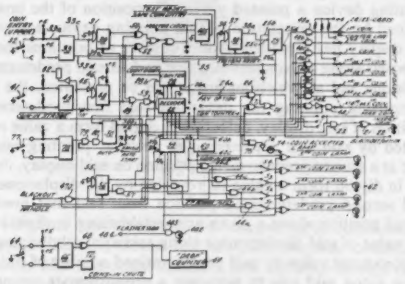
10. A lottery ticket, consisting of a single continuous strip of paper material, said strip being folded about spaced parallel folds into a pack of at least three superposed ticket sections, said pack comprising a first ticket section, a second ticket section integral with said first ticket section at the first of said folds, and a third ticket section integral with said first ticket section at the second of said folds, said second ticket section being placed between said first and third ticket sections and being of a shorter length than these, a first lottery sign being printed inside and across said first fold upon adjacent merging areas of said first and second ticket sections, a second lottery sign being printed inside and across said second fold upon adjacent merging areas of said first and third ticket sections, said first ticket section having weakening lines delimiting a first rupturable flap retained at and unfoldable about said first fold to expose the whole of said first lottery sign, and said first ticket section having further weakening lines delimiting a second rupturable flap retained at and unfoldable about said second fold to expose the whole of said second lottery sign; and means for sealing the ticket along opposite longitudinal edges thereof.

4,099,722

ELECTRONIC SLOT MACHINE

Dale F. Rodesch, and George E. Johnson, both of Las Vegas, Nev., assignors to Centronics Data Computer Corp., Hudson, N.H.

Filed Jul. 30, 1975, Ser. No. 600,209
Int. Cl.[2] A63F *5/04*
U.S. Cl. 273—143 R **24 Claims**



1. Apparatus for stepping a movable display means to one of N possible positions in a random fashion comprising:

multi-stage counter means;

free-running high frequency and low frequency generating means;

selection means for initiating a selection operation signal;

gate means;

bistable circuit means having set and reset states being normally in said set state and responsive to said selection signal to be reset;

first gating means responsive to said bistable circuit means for coupling said high frequency generating means to said counter means only when said bistable circuit means is in the set state to cause said counter means to be repeatedly stepped through its maximum capacity at an extremely high rate, and to disconnect said high frequency generator means from said counter means when said bistable circuit means is reset whereby the count then in said counter determines the final positon of the display means;

means for driving said display means in a stepwise manner;

second gating means for coupling said low frequency generating means to said stepping means when said bistable means is reset;

sensing means responsive to movement of said display means for generating pulses;

third gating means for coupling the output of said sensing means responsive to the stepping of said counter means from the count presently in the counter means to a predetermined count to disable said second gating means to stop said display means at the position related to the count stored in said counter when said first gating means was disabled.

4,099,723

MULTI-TIER GAME BOARD

Pablo T. Robinson, 4002 N. 59th Dr., Phoenix, Ariz. 85033

Filed Feb. 7, 1977, Ser. No. 766,083
Int. Cl.[2] A63F *3/02*
U.S. Cl. 273—241 **8 Claims**

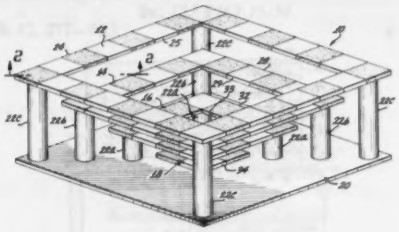
1. A variably configurable multi-tier game board for chess and checker games comprising:

(a) a first tier having a planar surface of square ring configuration upon which 28 playing squares and displayed, said first tier having an endless inner edge;

(b) a second tier vertically displaced from said first tier and having a planar surface of square ring configuration upon which 20 playing squares are displayed, said second tier having an endless outer edge which substantially matches

and is in vertical alignment with the inner edge of said first tier, said second tier having an endless inner edge;

(c) a third tier vertically displaced from said second tier and having a planar surface of square ring configuration upon which 12 playing squares are displayed, said third tier having an endless outer edge which substantially matches and is in vertical alignment with the inner edge of said second tier, said third tier having an endless inner edge;



(d) a fourth tier vertically displaced from said third tier and having a planar surface of square configuration upon which four playing squares are displayed, said fourth tier having an endless outer edge which substantially matches and is in vertical alignment with the inner edge of said third tier; and

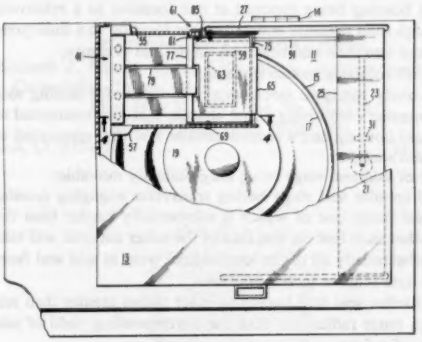
(e) each of said first, second, third, and fourth tiers being a separate entity to allow vertical rearrangement and spacing alterations therebetween.

4,099,724

AUTOMATIC DISC WIPING APPARATUS

Larry Dean Huff, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1976, Ser. No. 748,052
Int. Cl.² G11B *3/58*
U.S. Cl. 274—47 **10 Claims**



1. In a disc player including a base: a turntable mounted for rotation relative to said base and having a surface adapted to receive a disc record having a groove with information recorded therein; a stylus (21) subject to positioning in said groove for recovering said information; a signal pickup carriage for supporting said stylus, said carriage being mounted on the base for translational motion between an off-record standby position and above-record playback positions; and a lid pivotally mounted on said base for movement between a closed position and an open position; the combination comprising:

a pad for wiping the surface of a disc subject to being received on said turntable;

means for mounting said pad to the underside of said lid; said mounting means being subject, when said lid is in said closed position, to occupancy of a wiping position where said pad is in contact with the surface of the turntable; said mounting means being also subject to movement between said wiping position and a normal position where the pad is out of contact with the surface of the turntable;

defeasable means for effecting movement of said mounting means towards said normal position; and

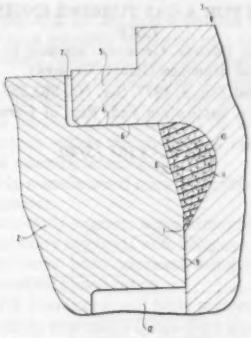
means, including an engaging element coupled to the pickup carriage and subject to movement therewith, for defeating said movement effecting means in response to the translational travel of said signal pickup carriage during only a portion of the carriage travel between the off-record standby and above-record playback positions.

4,099,725

SEAL OF THE UPPER AREA OF A WET CYLINDER LINER

Gerhard Wolters, Gaggenau, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 23, 1977, Ser. No. 809,403
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628674
Int. Cl.² F02F *1/24;* F16J *15/14*
U.S. Cl. 277—1 **12 Claims**



1. A seal for the upper area of a wet cylinder liner with respect to a crankcase of a reciprocating piston internal combustion engine, in which a liner collar of the cylinder liner rests with a collar surface on a support surface provided at the crankcase, and which includes an annular space formed by at least one of the two parts consisting of a recess in the cylinder liner underneath the liner collar and a chamfer at the crankcase inside of the support surface, a sealing material being disposed in said annular space, characterized in that a thin layer of deformable sealing material is applied between the collar surface and the support surface.

4,099,726

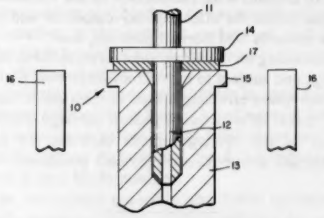
PACKING FOR CRYOGENIC SEAL JOINT

Roy C. Laible, Jamaica Plain, and Ari Brynjolfsson, Wayland, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 8, 1977, Ser. No. 831,452
Int. Cl.² F16J *15/10;* F17C *7/02;* B32B *27/34*
U.S. Cl. 277—1 **8 Claims**

1. A method of preventing the escape of liquid nitrogen and nitrogen gas from an apparatus for treating materials with high energy ionizing radiation while said materials are being maintained at temperatures below about −40° C. with liquid nitro-

gen, which comprises packing each connectible and disconnectible joint of said apparatus through which said liquid nitrogen is conducted with a packing element consisting essentially of filaments of poly (p-phenylene terephthalamide).



4,099,727

SEAL SYSTEM FOR A GAS TURBINE ENGINE OR THE LIKE

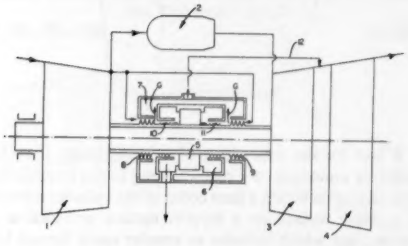
Wolfgang Weiler, Dachau, Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Germany

Filed Jun. 3, 1977, Ser. No. 803,383

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625551

Int. Cl.² F16J 15/40

U.S. Cl. 277—3 10 Claims



1. Sealing apparatus for a gas turbine engine or the like of the type having compressor means, said compressor means including a turbomachine shaft and bearing means in a bearing chamber for said turbomachine shaft, said sealing apparatus comprising:

a dual labyrinth system having first and second labyrinth seal means interposed between a supply of high pressure sealing medium and said bearing chamber,

said labyrinth seal means including contact-free seal portions which permit passage of said sealing medium while reducing the pressure thereof, whereby the pressure of said sealing medium is sequentially reduced as it passes through said first and second labyrinth seal means into said bearing chamber,

wherein a second chamber is provided which surrounds said bearing chamber, wherein said first labyrinth seal means are disposed between said supply of high pressure sealing medium and said second chamber, and wherein said second labyrinth seal means are disposed between said second chamber and said bearing chamber.

4,099,728

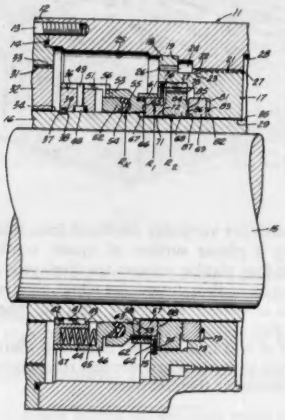
MECHANICAL SEAL ASSEMBLY

Winfred John Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 17, 1977, Ser. No. 842,863

Int. Cl.² F16J 15/34

U.S. Cl. 277—96 7 Claims



1. A mechanical seal assembly comprising:

a housing having a shaft opening;

said housing being exposed at one location to a relatively high fluid pressure and at another location to a fluid pressure less than said relatively high fluid pressure;

a shaft rotatable in said opening;

relatively rotatable mechanical seal means for sealing said opening comprising a first annular seal ring connected to said housing and a second annular seal ring connected to said shaft;

one of said seal rings being longitudinally movable;

said annular seal rings having transverse engaging annular seal faces; one of which is substantially harder than the other such that the seal face of the softer material will take substantially all of the longitudinal wear as said seal faces rotate relative to one another;

said softer seal face having an inner radius greater than and an outer radius less than the corresponding radii of said harder face;

said seal ring having said harder seal face having a balance radius of constant length greater than the inner radius yet less than the outer radius of said softer seal face;

said softer seal face being provided by an annular boss on said other seal ring having an outer side sloping outwardly in a direction away from said one seal ring and in inner side sloping inwardly in a direction away from said other seal ring;

the slopes of the sides of said boss being selected in relation to the balance radius, and the inner and outer radii of the softer seal face such that, as said boss wears away in operation of the seal, the inner radius of said softer seal face decreases and the outer radius of said softer seal face increases to maintain the balance of said seal rings substantially constant.

4,099,729

STUFFING BOX BACKSTOP RING

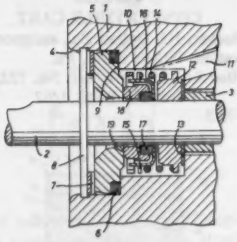
Hans Peter Glud Nylykke, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation-in-part of Ser. No. 697,671, Jun. 18, 1976, abandoned, and Ser. No. 697,672, Jun. 18, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 809,157

Claims priority, application Denmark, Feb. 6, 1976, 483/76; Jun. 18, 1975, 2742/75

Int. Cl.[2] F16J 15/34

U.S. Cl. 277—96.1 6 Claims



1. A backstop ring for a stuffing box or the like adapted to cooperate with a carbon sealing ring to provide sealing for dynamic and static operation, comprising, an annularly shaped member having a generally flat sealing surface, said surface having characteristic grinding marks orientated to cause fluid to be pumped in a selected radial outward direction, the flatness of said sealing surface having a deviation of less than six microns and said marks having roughness between 0.2 and 2 microns.

4,099,730

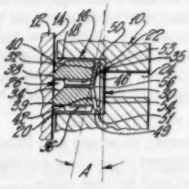
PISTON RING CONSTRUCTION

Kenneth J. Nisper, Spring Lake, Mich., assignor to Questor Corporation, Toledo, Ohio

Filed May 31, 1977, Ser. No. 802,179

Int. Cl.[2] F16F 1/34; F02F 5/00

U.S. Cl. 277—139 11 Claims



1. A spacer-expander ring for a piston ring construction comprising a parted ring body having a group of circumferentially-spaced strut sections, connectors arranged in two rows integrally joining the ends of adjacent pairs of strut sections, the connectors of the rows being bent inwardly toward one another whereby the connectors of one row are in staggered relation with respect to connectors of the other row, said rows of connectors forming a second group of sections, portions of the connector sections being radially spaced from portions of the strut sections, one of said groups of sections being arranged for radial engagement with a piston ring.

4,099,731

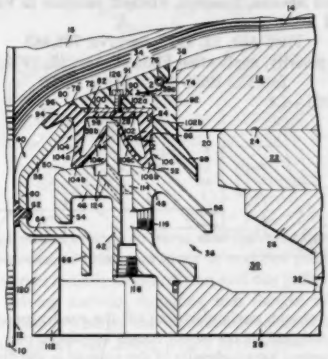
SEAL

Lowell S. Salter, Jr., Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Continuation of Ser. No. 620,438, Oct. 7, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 749,937

Int. Cl.[2] F16J 15/34

U.S. Cl. 277—164 6 Claims



1. In a rolling mill, for use in combination with a work roll having a roll neck rotatably supported by a bearing contained in a bearing chock, with a circular nonrotatable seal end plate surrounding and spaced radially from the roll neck at a location between the bearing chock and the roll end face, a neck seal assembly adapted to be mounted on the roll neck for rotation therewith within the confines of the seal end plate, said neck seal assembly comprising:

(a) separately manufactured circular flexible inner and outer body segments;

(b) said inner body segment being arranged radially within said outer body segment, with adjacent portions of said inner and outer body segments being in direct sealing engagement with each other;

(c) means for connecting said body segments together and for preventing movement of one body segment relative to the other body segment;

(d) interior surface means on said inner body segment for sealingly engaging the roll neck; and,

(e) flanges integral with and extending radially from said outer body segment to frictionally engage the seal end plate.

4,099,732

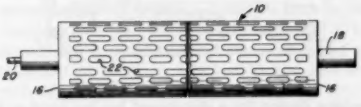
EXPANDABLE SHAFT

James W. Threatt, Rte. 1, Box 159, Darlington, S.C. 29532

Filed Jun. 3, 1977, Ser. No. 803,297

Int. Cl.[2] B23B 31/40; B65H 65/18

U.S. Cl. 279—2 A 6 Claims



1. An expandable shaft for the mounting of cores, mandrels, blade holders, and working tools, said shaft comprising:

an expandable elastomeric liner and an expandable metal shell, said shell having multiple openings defined therethrough, said liner being received within and closely conforming to the interior of said shell with portions of the liner extending into and filling the openings defined through the shell, said shell and said liner defining a pres-

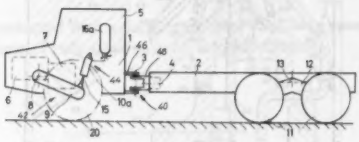
surizable internal chamber and said shell and liner being substantially simultaneously expandable upon pressurizing the internal chamber, and said shell and the liner portions extending through the openings presenting a smooth continuous outer shaft surface after being expanded.

4,099,733

OFF-THE-ROAD VEHICLES

Ahti Ilmari Ahonen, Tampere, Finland, assignor to Valmet Oy, Finland

Filed Apr. 11, 1977, Ser. No. 786,463
Claims priority, application Finland, Apr. 12, 1976, 760992
Int. Cl.[2] B60S 9/00; B60G 17/00
U.S. Cl. 280—6.1 **9 Claims**



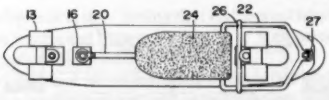
1. In a vehicle, particularly an off-the-road type of vehicle which is adapted to travel on rough terrain, a pair of frame means arranged longitudinally of the vehicle in the direction of travel thereof, and a pair of ground-engaging means respectively operatively connected to said pair of frame means and extending downwardly therefrom into engagement with the ground beneath said pair of frame means to support said pair of frame means for travel along the ground, suspension means operatively connected to one of said ground-engaging means and the frame means associated therewith for forming the operative connection between the latter ground-engaging means and frame means, joint means operatively connected with both of said frame means for interconnecting said pair of frame means for turning movement with respect to each other at least about an axis which extends longitudinally of the vehicle and which is substantially horizontal when the pair of ground-engaging means engage substantially horizontal ground, and a pair of elastically yieldable means one of which forms part of said suspension means for elastically and yieldably interconnecting the ground-engaging means and frame means which are operatively connected to each other by way of said suspension means and the other of which is operatively connected with said joint means for elastically and yieldably opposing relative turning of said pair of frame means with respect to said axis of said joint means.

4,099,734

SKATEBOARD BRAKE

Fred Lowery, P.O. Box 1183, Pebble Beach, Calif. 93953

Filed May 16, 1977, Ser. No. 797,125
Int. Cl.[2] A63C 17/14
U.S. Cl. 280—11.2 **3 Claims**



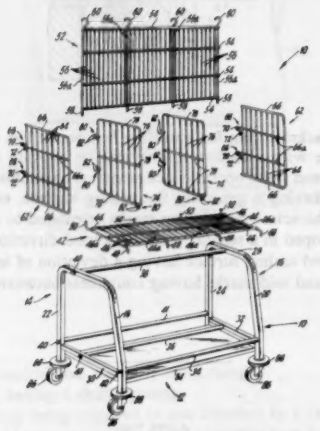
1. A braking device for a skateboard having front and rear wheel assemblies, comprising friction means adapted to frictionally engage the surface on which said skateboard travels, said friction means extending below and along a substantial longitudinal extent of said skateboard, a bracket secured to said friction means subjacently of said skateboard, a ball pivot secured to a forward portion of said skateboard adjacent said front wheel assembly and depending downwardly therefrom, a collar secured to a forward end of said bracket and engaging said ball pivot to permit rotation of said bracket and said friction means in a vertical plane, a portion of said friction means being disposed forwardly of the longitudinal midpoint of said skateboard, a rear portion of said bracket circumscribing said rear wheel assembly and a plunger extending upwardly therefrom; a slot in a rear portion of said skateboard through which said plunger extends freely, a pedal secured to a rear portion of the upper surface of said skateboard, said pedal having a free end impinging on the upper end of said plunger, and resilient means secured to said skateboard and said bracket for biasing said bracket, friction means, plunger, and pedal upwardly.

4,099,735

CONVERTIBLE CART

Frederick R. Becker, III, Dallas, Pa., assignor to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Filed Sep. 13, 1976, Ser. No. 722,550
Int. Cl.[2] B62B 3/02
U.S. Cl. 280—79.3 **25 Claims**



10. A convertible cart comprising:

(a) frame means including a pair of laterally spaced apart end members each having front and rear legs and connecting transverse members proximate upper and lower ends thereof, respectively;

(b) first and second lateral support means extending between said end members, said first support means being coupled to lower ends of said front legs, and said second support means being coupled to lower ones of said connecting transverse members;

(c) third lateral support means extending between and coupled to upper ones of said connecting transverse members;

(d) a bottom mat loosely mounted on said first and said second lateral support means;

(e) a back mat having an upper end loosely coupled to said third lateral support means and having a lower end positioned adjacent said bottom mat;

(f) at least one panel disposed forwardly from said back mat and upwardly from said bottom mat, said one panel including hinge means for releasably engaging a first rod-like member of said back mat, said hinge means including second rod-like members extending rearwardly from and being secured to said one panel, said hinge means being arranged for permitting limited pivotal movement of said one panel with respect to said back mat when said second rod-like members engage said first rod-like member;

(g) shelf means integral with said frame means; and

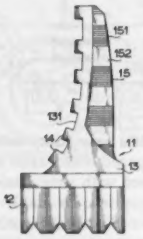
(h) said bottom mat, said back mat, and said at least one panel are each comprised of a plurality of rod-like members secured to each other in a grid-like pattern.

4,099,736

MUDGUARD FOR A VEHICLE

Akira Shiina, 60 Nukari, Kamiyoshima, Yoshima-machi, Iwakishi, Fukushima Prefecture, Japan

Filed Dec. 7, 1976, Ser. No. 748,183
Claims priority, application Japan, Jun. 11, 1976, 51-075852
Int. Cl.[2] B62D 25/16
U.S. Cl. 280—154.5 R 7 Claims



1. A mudguard assembly for a vehicle comprising:

(a) an integral mudguard formed of an elastic material and having an attaching plate with a curved side so that the plate narrows gradually towards one end, the thickness of said attaching plate decreasing in stepwise manner in a direction from the curved side to the side opposite the curved side;

a plurality of spaced-apart members protruding from the curved side of said attaching plate; and

a mudguard main plate connected to the end of said attaching plate opposite the narrow end, the thickness of said main plate decreasing in stepwise manner from the end connected to the attaching plate to the end opposite the connected end; and

(b) a plurality of attaching members for attaching said attaching plate to the body of a vehicle, each of said attaching members having:

(1) an attaching body with a generally]-shaped sectional area and having a groove defined by its side walls, one of its side walls having a threaded opening defined therein,

(2) a holding body engageable with the attaching body and having a generally]-shaped sectional area, one side wall of the holding body being positionable inside the groove defined by the side walls of the attaching body, the other side wall of the holding body having an opening defined therein and being positionable outside of the groove, and

(3) a threaded bolt insertable through the openings in the side walls of said attaching body and said holding body for connecting said bodies to each other so that parts of the body of the vehicle and the curved side of said attaching plate are positioned and held between the side walls of said attaching body and said holding body.

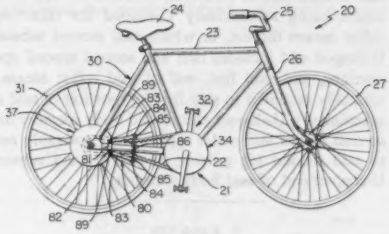
4,099,737

BICYCLE BELT DRIVE SYSTEM

Dale L. Waugh, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Apr. 27, 1977, Ser. No. 791,615
Int. Cl.[2] B62M 9/00
U.S. Cl. 280—261 20 Claims

1. A bicycle belt drive system comprising, a driving pulley rotatably supported by said bicycle and having a toothed hub portion and a pair of opposite side flanges, a driven pulley carried by a wheel of said bicycle for rotation therewith and having a toothed hub portion and a pair of opposite side flanges, one of said pulleys having at least one of its flanges which is axially movable relative to the other, speed responsive means adapted to engage and move said one flange in response to rotational speed thereof, and a toothed endless power transmission belt having opposed driving surfaces which are adapted to engage said side flanges and having teeth adapted to engage and drive said toothed hub portions of said pulleys, said teeth of said belt engaging said toothed portions immediately upon starting said bicycle to provide a more positive interconnection between said driving and driven pulleys, said speed



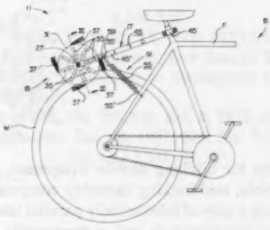
responsive means serving to move said movable flange axially with an increase in rotational speed of said one pulley causing said belt to ride radially outwardly on said one pulley with said opposed driving surfaces engaging said flanges of said one pulley to thereby change the mechanical advantage between said driving pulley and driven pulley in response to said speed of said bicycle.

4,099,738

BICYCLE ACCESSORY MEANS

Elbert F. Allen, 2685 Country Green Rd., Memphis, Tenn. 38134

Filed Jan. 3, 1977, Ser. No. 756,471
Int. Cl.[2] B62J 5/20; A63H 5/00
U.S. Cl. 280—289 D 5 Claims



1. Accessory means for attachment to a bicycle or the like of the type including a frame and at least one rotatable wheel mounted on the frame, said accessory means comprising:

(a) roller means for rotation with the wheel of the bicycle, said roller means having first and second ends;

(b) attraction-getting means including first and second attraction-getting platelike members for being fixedly attached to said respective first and second ends of said roller means for rotation therewith, said first and second attraction-getting platelike members each having a predominant face surface directed outwardly of said roller means, said attraction-getting means including a plurality of reflective members attached to said face surfaces of each of said first and second attraction-getting platelike members;

(c) connector means for attaching said roller means to the frame of the bicycle, said connector means including a substantially rigid body member having a first end for attachment to the frame of the bicycle and having a second end for attachment to said roller means; and

(d) spring means for forcing said roller means against the wheel of the bicycle to cause said roller means to frictionally engage the wheel of the bicycle so that said roller

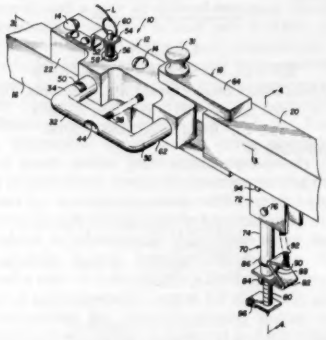
means will rotate when the wheel of the bicycle rotates; said first end of said body member of said connector means being substantially U-shaped for receiving a portion of the frame of the bicycle therein, said connector means including means for selectively clamping said first substantially U-shaped end about a portion of the frame of the bicycle to fixedly attach said body member thereto, said second end of said body member of said connector means being substantially U-shaped for receiving said roller means therein, in which said second substantially U-shaped end includes first and second spaced apart leg portions, and said first end of said roller means being rotatably mounted to said first leg portion of said second substantially U-shaped end of said body member and said second end of said roller means being rotatably mounted to said second leg portion of said second substantially U-shaped end of said body member.

4,099,739

HITCHING APPARATUS

Newman Clarence Foley, Superior, Wis., assignor to N.B.F. Company, Inc., Superior, Wis.

Filed Jan. 17, 1977, Ser. No. 759,776
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—504 **7 Claims**



1. Apparatus for hitching mobile equipment, comprising a locking assembly, said locking assembly comprising:

a base having a pair of substantially parallel laterally extending bores therethrough and a rearwardly opening slot intersecting one of said bores,

a substantially U-shaped locking member having a pair of generally laterally extending legs having inner ends slidably mounted in said bores, said locking member being movable between a closed position wherein one of said legs extends across said rearwardly opening slot to close it and an open position wherein said one leg is removed from said slot,

means for urging said locking member to said closed position, and

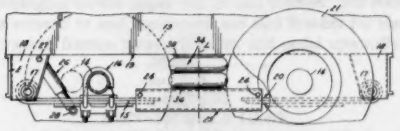
means for releasably retaining said locking member in said open or said closed position, said retaining means comprising a locking pin movably mounted on said base said locking pin having an inner end and an outer end, said inner end being movable into the other of said bores, and the other of said legs having a first notch therein adapted to receive said locking pin therein, whereby said locking pin serves to retain said locking member in said closed position by movement of said locking pin into said other bore and into said notch in said other leg and said locking pin serves to retain said locking member in said open position against the force of said urging means by movement of said locking pin into said other bore wherein it is engaged by the inner end of said other leg.

4,099,740

SPRING-AIR TANDEM SUSPENSION

Donald J. McGee, Troy, Mich., assignor to H & H Equipment Co., Detroit, Mich.

Filed Jul. 29, 1976, Ser. No. 709,868
Int. Cl.[2] B60G *5/02*
U.S. Cl. 280—678 **6 Claims**



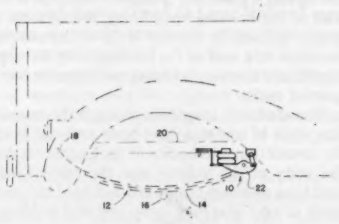
1. An improvement in a heavy duty vehicle characterized by a pair of fore and aft-spaced wheel axles mounted on a vehicle frame and each equipped with a mechanical springing device; said improvement comprising a single mechanical floating beam disposed in front-to-rear alignment with and between said fore and aft springing devices, being operatively connected adjacent its opposite ends to said springing devices, and a single fluid-pressure cushion unit vertically interposed between said beam and a part of said frame, said cushion unit being located substantially equidistant from said operative end connections of the beam to said fore and aft springing devices respectively and being in a substantially horizontally equally spaced relation to said connections.

4,099,741

SUPPLEMENTAL AIR SPRING ASSEMBLY

Philip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Inc., Fresno, Calif.

Filed Dec. 6, 1976, Ser. No. 747,880
Int. Cl.[2] B60G *11/46*
U.S. Cl. 280—712 **5 Claims**



1. In a front end suspension system for a motorized vehicle characterized by a wheel-supported axle having a transversely oriented leaf spring assembly mounted on the axle and attached at its leading end to a longitudinal frame member for the vehicle, a supplemental air spring assembly comprising:

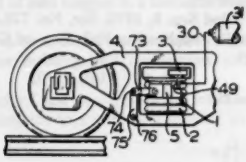
a load dissipating arm pivotally connected near its midportion to the trailing end of the leaf spring assembly, an air bag seated on one end portion of the arm and disposed between a pair of parallel planes intersecting the opposite ends of the leaf spring assembly in load supporting relation with said frame member, and coupling means including a rigid link connecting the opposite end portion of the arm to said frame member restraining the arm for oscillatory motion about a horizontal axis disposed in space relation therewith.

4,099,742

CONTROL VALVE DEVICE FOR VEHICLE AIR SPRINGS

Raymond C. Wright, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jun. 8, 1976, Ser. No. 693,746
Int. Cl.[2] B60G 17/10
U.S. Cl. 280—714 14 Claims



1. A control valve device for so controlling the pressure of a fluid in an air spring between the sprung and unsprung portions of a vehicle as to support the sprung portion at a substantially constant preselected height above the unsprung portion irrespective of the load carried by the sprung portion, said control valve device comprising:

(a) a casing having a plurality of bores therein, said casing being attached to the sprung portion;

(b) a supply and a release valve mechanism each having a valve operating stem for effecting the operation thereof, whereby operation of said supply valve mechanism causes the supply of fluid under pressure to the air spring and operation of said release valve mechanism causes the release of fluid under pressure from the air spring to atmosphere;

(c) a cam rockably mounted with respect to said casing and rockable in one direction or in an opposite direction in response to a deflection of said sprung portion as the vehicle load is increased or decreased;

(d) actuator means movable in one direction in response to rocking of said cam in said one direction for actuating the valve stem of said supply valve mechanism to cause the supply of fluid under pressure to the vehicle air spring, and movable in an opposite direction in response to rocking of said cam in said opposite direction for actuating the stem of said release valve mechanism to cause the release of fluid under pressure from said air spring;

(e) means for limiting the rate of movement of said actuator means in said one and said opposite directions, said rate being chosen to reflect the rate of deflection of the vehicle sprung portion resulting from a load change; and

(f) a pair of resilient means, one being interposed between said cam and said actuator means and the other interposed between said casing and said actuator means whereby said movable means is urged in said one direction or in said opposite direction accordingly as said cam is rocked in said one direction or in said opposite direction, said one of said pair of resilient means further providing for rocking of said cam when the rate of deflection of the vehicle sprung portion is such as to exceed the limiting rate of movement of said actuator means.

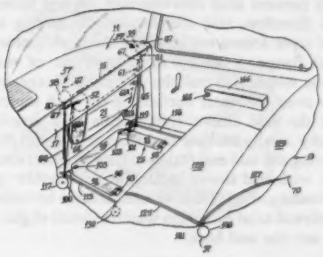
4,099,743

PASSIVE RESTRAINT SYSTEM WITH HEAD AND KNEE RESTRAINT

Tse Quong Non, 2315 S. Wentworth Ave., Chicago, Ill. 60616

Filed Feb. 10, 1977, Ser. No. 767,475
Int. Cl.[2] B60R 21/02
U.S. Cl. 280—753 6 Claims

1. A safety-belt system for a vehicle comprising a chest restraint element movable from a stowage position located adjacent the vehicle's dashboard to a restraint position about the vehicle's occupant's chest, cable means to shift the chest restraint element from the stowage position to the restraining position with the restraint element extending across the occupant's chest, power means for returning the chest restraint element from the restraining position to the stowage position after use for reuse, an electrically operated control means operable upon a predetermined deceleration of the vehicle to operate the shifting means to shift the chest restraint element automatically from the stowage position to the restraint position, a head restraint means movable from a stowage position located adjacent the vehicle's dashboard to a restraint position for restraining the occupant's head, said head restraint being



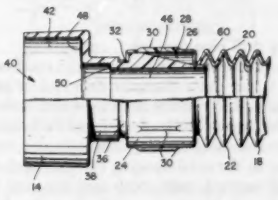
connected to said chest restraint element and being movable therewith until said chest restraint engages said chest, said cable means having a portion thereof continuing to shift said head restraint element independently of said chest restraint element and upwardly and rearwardly toward the face of the occupant after said chest restraint element has engaged the occupant's chest, said cable means and said power means moving the head restraint means between its stowage position and its restraint position.

4,099,744

SNAP-IN SWIVEL END FITTING

Thomas A. Kutnyak, Greenwood, and George T. Dunn, Abbeville, both of S.C., assignors to Automation Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 592,869, Jul. 3, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,857
Int. Cl.[2] F16L 33/00
U.S. Cl. 285—7 12 Claims



1. A hose comprising:

an elongated flexible walled section terminating at one end thereof in a substantially rigid walled tubular cuff, said flexible walled section being integrally molded to said cuff, said cuff having an interior opening, said flexible walled section having an elongated interior chamber, said interior opening being contiguous with said elongated interior chamber, said cuff having a snap lock comprising an inwardly extending radial flange located at the free end of said cuff and an axially located sleeve attached to the free edge of said flange and extending outwardly therefrom;

an end fitting adapted to be partially inserted within said interior opening of said cuff forming a substantially air-

tight connection therebetween, said end fitting includes a section having a tapered exterior surface and an interior cylindrical wall, said tapered section locatable within said interior opening, the leading edge of said tapered section having an outer diameter less than the inner diamger of said radial flange, the outer diameter of said tapered section increasing from said leading end to a diameter greater than the inner diameter of said radial flange, an inwardly extending annular groove formed within said end fitting at the back end of said tapered section, said annular groove defined by two axially disposed radial faces which normally prevent axial movement of the end fitting in either axial direction, said annular groove having a diameter equal to or somewhat less than the inner diameter of said radial flange, whereby upon insertion of said tapered section within said cuff the said radial flange expands and rides over the outer surface of the said tapered section until the said sleeve rests within said annular groove thereby axially locking said hose in said end fitting while allowing the said end fitting to freely rotate relative to said hose, with said sleeve located in said annular groove the said leading edge of said tapered section includes a hollow cylindrical axial extension which extends slightly past said cuff into the said hose.

4,099,745

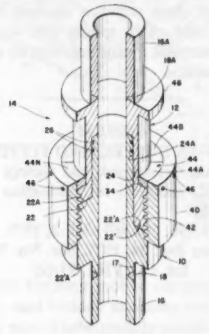
DRILL PIPE JOINT

James H. Cobbs, 5144 S. New Haven, Tulsa, Okla. 74135

Filed Apr. 4, 1977, Ser. No. 784,288

Int. Cl.² F16L *35/00*

U.S. Cl. 285—24 **7 Claims**



1. A rotary drill pipe tool joint, comprising;

(a) a pin section and a box section, both sections of said tool joint of larger outer diameter than that of said drill pipe, and adapted to be attached at their first ends individually to first and second ends of a joint of drill pipe, by conventional means, axial openings through said sections corresponding to the axial opening through said pipe;

(b) at their second ends, both said pin and box sections threaded with identical straight threads of any selected form;

(c) a plurality of longitudinal tongues and grooves cut into the ends of said theaded portions, of selected width and angular spacing such that the tongues on the end of the pin section will fit into the grooves of the box section, and vice versa, and means to polarize said tongues and grooves so that the two parts of a tool joint will fit together in only one angular position;

whereby when said parts are meshed, the threads on the two parts will be collinear with each other;

(d) a cylindrical extension on the second end of said pin section, and an axial socket on the second end of said box section, of corresponding diameters, and means to seal said extension in said socket; and

(e) threaded collar means adapted to screw over the threaded meshed tongues, to couple said pin and box sections together.

4,099,746

EQUALIZING ARRANGEMENT FOR A LOW TEMPERATURE LINE

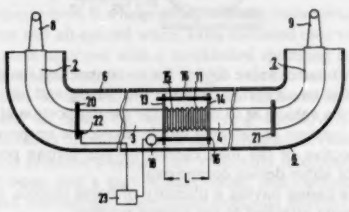
Otmar Kontsch, Sankt Stefan, Austria, and Fritz Schmidt, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 8, 1976, Ser. No. 721,486

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1975, 2541219

Int. Cl.² F16L *51/02*

U.S. Cl. 285—119 **10 Claims**



1. An equalizing arrangement for a low temperature line having at least one rigid inner tube enclosed by an outer tube, the inner tube being used for the conduction of a cryogenic medium comprising:

a. a compensating element forming part of the inner tube and connecting two sections thereof; and

b. an expansion device associated with the compensating element, said expansion device rigidly coupling the two tube sections which are connected by said compensating element, the expansion device being such that it establishes a predetermined length for every given temperature between normal ambient temperature and the temperature of the cryogenic medium conducted by said inner tube.

4,099,747

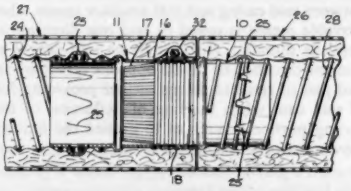
AIR DUCT CONNECTING ASSEMBLY

Robert Henry Meserole, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Nov. 12, 1976, Ser. No. 741,319

Int. Cl.² F16L *59/14*

U.S. Cl. 285—174 **5 Claims**



1. An air duct connecting assembly comprising,

a. a sleeve-like male connector,

b. a sleeve-like female connector, each of said connectors having circumferentially overlapping and overlapped portions,

c. means integral with each of said connectors for retaining each connector in said sleeve-like configuration,

d. said means comprising:

(i) a tongue extending circumferentially from a longitudinal edge of said overlapping portion, said tongue having a longitudinal extent less than said longitudinal edge and having at least one detent in an intermediate portion

thereof, said detent having a radially inwardly protruding locking edge,

(ii) a slot in said overlapped portion, said slot having at least one edge for cooperating with said locking edge when said detent passes through said slot, and

(iii) a louver-like radially outwardly protruding hood covering said slot, said hood having a longitudinally extending opening for receiving said tongue and having a longitudinally extending wall portion for limiting movement of said tongue in a circumferential direction, and

e. cooperating means on said male connector and said female connector for holding said connectors in a telescoped relationship,

f. means on each of said connectors for mechanically securing each connector to a core of a tubular air duct.

4,099,748

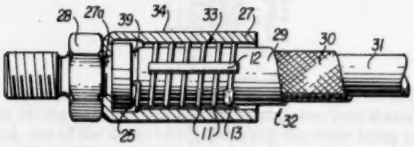
HOSE COUPLING ASSEMBLY

Edward M. Kavick, Chardon, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio

Filed Nov. 12, 1976, Ser. No. 741,372

Int. Cl.[2] F16L *33/20*

U.S. Cl. 285—256 **12 Claims**



1. A coupling adapted for use on the end of a hose or tube comprising a body member, a pintle member extending from the body member and having a central longitudinal axis therethrough, a compressive member disposed in encompassing relationship about the pintle member and secured at one end thereof to the body member, a coil insert member disposed between the compressive member and the pintle member, said coil insert member comprising a plurality of coils disposed about the pintle member and which completely encircle the pintle member while in a radially uncompressed state prior to attachment of the coil insert member to the hose or tube, said coils having an inner diameter thereof disposed radially outwardly substantially equi-distant from the longitudinal axis of the pintle member for a distance from the outer surface of the pintle member sufficient to permit insertion therebetween of the wall of a hose or tube to which the coupling is to be attached, and said coils having at least a portion thereof secured in a spaced-apart relationship to each other by means of a plurality of circumferentially-spaced longitudinally extending members which extend between at least a portion of the coils to prevent warpage thereof and to more uniformly distribute the radially inwardly compressive force transferred to the coils as a result of compressing the compressive member radially inwardly during the process of attaching the coupling to the hose or tube.

4,099,749

COUPLING SLEEVE

Cors van Vliet, Zwolle, Netherlands, assignor to Air-O-Mulder B.V., Kampen, Netherlands

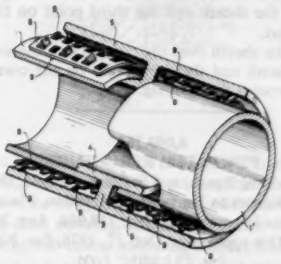
Filed Mar. 24, 1975, Ser. No. 561,345

Claims priority, application Netherlands, Apr. 8, 1974, 7404779

Int. Cl.[2] F16L *21/00*

U.S. Cl. 285—398 **1 Claim**

1. For use in interconnecting ventilation duct elements made of sheet material having smooth end portions, a coupling member comprising a coupling sleeve having at least two substantially spaced apart parallel flanges interconnected by a web portion, said flanges differing mutually as to axial length, the shortest flange adjoining one end of the web portion and the longest flange adjoining the other end of said web portion, the surfaces of the flanges which face one another being parallel and wedge locking means between said coupling sleeve and said ventilation duct elements and positioned on each side of said web portion and comprising a loose resilient strip having



a plurality of upwardly and downwardly obliquely protruding teeth formed integrally from said strip, said teeth being disposed in a plurality of rows extending longitudinally and transversely to the major axis of said coupling sleeve, whereby each duct element may be easily inserted in one direction between the strip and one of the flanges and when the duct element is moved in the opposite direction said teeth will engage and lock said duct element to said coupling sleeve.

4,099,750

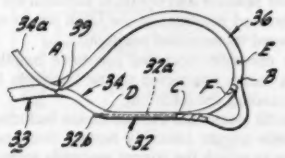
METHOD OF FORMING EYE SPLICE IN DOUBLE BRAIDED LINE

James D. McGrew, 8120 Rio Linda Blvd., Elverta, Calif. 95626

Filed Sep. 2, 1977, Ser. No. 830,109

Int. Cl.[2] B65H *69/04*

U.S. Cl. 289—1.5 **4 Claims**



1. A method of forming an eye splice in a double braided line having a core and a sheath using a fid having a flexible handle with a pointed end and a hook extending from the other end of the handle, comprising the steps of:

a. forming an opening in the sheath at a first point thereon;

b. pulling the core out of the sheath through the opening;

c. forming a knot in the end of the core;

d. hooking the hook of the fid around the knot in the end of the core;

e. whipping the end of the core to the fid;

f. inserting the pointed end of the fid into the sheath at a second point on the sheath between the first point and the end of the sheath, working the fid and core through the sheath to the opening and pulling the fid and the end of the core of the sheath through the opening;

g. removing the fid from the end of the core;

h. forming a knot in the end of the sheath;

i. hooking the hook of the fid around the knot in the end of the sheath;

j. whipping the end of the sheath to the fid;

k. pulling the core farther out of the sheath through the opening;

l. inserting the pointed end of the fid into the core at a third point on the core between the first and second points, working the fid and sheath through the core to a fourth point on the core between the third and first points and pulling the fid and the end of the core out of the sheath at the fourth point;

m. removing the fid from the end of the sheath;

n. pulling the ends of the sheath and core to bring the second point on the sheath and the third point on the core together; and,

o. milking the sheath over the core so that the second point on the sheath and the third point on the core enter the sheath through the opening.

4,099,751

PIN LATCH STRUCTURE

Lloyd R. Poe, Long Beach, and Frank L. Sawyer, Orange, both of Calif., assignors to Hartwell Corporation, Placentia, Calif.

Continuation-in-part of Ser. No. 718,066, Aug. 26, 1976, abandoned. This application Oct. 27, 1976, Ser. No. 735,967

Int. Cl.[2] E05C *1/06*

U.S. Cl. 292—139 **9 Claims**

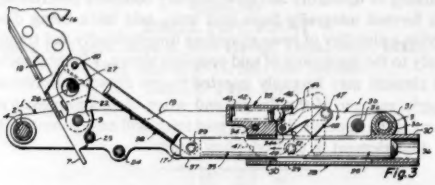


Fig. 3

1. A latching structure comprising:

a. a mounting means including a guide sleeve;

b. a latch pin axially reciprocable with respect to the guide sleeve between an extended position, an intermediate position and a retracted position;

c. yieldable means interconnecting the mounting means and latch pin operable between the intermediate and extended positions of the latch pin tourge the latch pin toward its extended position and operable between the intermediate and retracted positions of the latch pin to urge the latch pin toward its retracted position;

d. and a manually operated pivotable handle means and linkage means connected to the latch pin for retracting and extending the latch pin;

e. the handle means and linkage means including a manually engagable trigger assembly having two positions, a first position in which the trigger assembly secures the handle means in a flush condition, and a second position in which the trigger assembly secures the handle means in a manually accessible position while the latch pin remains in its latch position.

7. The combination with a flush latch structure including a handle assembly pivotable between a flush position and an extreme angular position, a fixed guide sleeve underlying the handle assembly, a latch pin slidable in the sleeve and connected by first linkage means to the handle assembly between an extended position, when the handle assembly is in its flush position, and a retracted position when the handle assembly is in its extreme angular position of an overcenter operating means comprising:

a. a support fixed with respect to the guide sleeve;

b. second linkage means extending between the support means and the latch pin;

c. the second linkage means being movable between a first position, when the latch pin is extended through an intermediate position, a second position when the latch pin is retracted;

d. and yieldable means operable, when the second linkage means is between its first position and its intermediate position, to urge the latch pin toward its extended position and operable, when the second linkage means is between its intermediate position and second position, to urge the latch pin toward its retracted position.

4,099,752

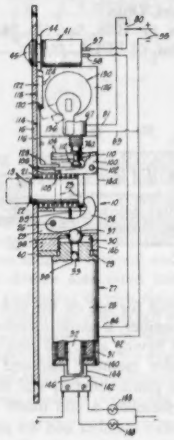
ELECTRIC LOCK

Arthur V. Geringer, 5424 Geyser Ave., Tarzana, Calif. 91356

Continuation-in-part of Ser. No. 593,966, Jul. 8, 1975, Pat. No. 4,021,065. This application Jan. 27, 1977, Ser. No. 763,023

Int. Cl.[2] E05C *1/06*

U.S. Cl. 292—144 **10 Claims**



1. In an electric door lock which includes an elongate housing adapted for mounting in a door or frame member, a bolt supported in said housing for movement between a projected locking position and a retracted non-locking position, means normally urging said bolt toward its retracted position and solenoid means for actuating said bolt to a projected locking position; improved deadlocking means automatically operable to releasably lock said bolt in said locking position, said deadlocking means comprising:

an elongate lever member pivoted at one end in said housing for limited vertical swinging movement between deadlocking and non-deadlocking positions with respect to said bolt, said lever member being formed at its other end to provide spaced upper and lower finger portions, said lower finger portion being positioned to engage behind the inner end of said bolt upon movement of said bolt to its projected locking position;

means urging said member to its deadlocking position in response to movement of said bolt to its locking position; and

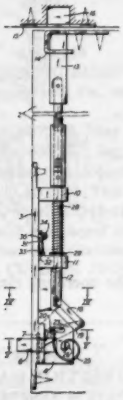
means for releasing said deadlocking member, comprising a movably mounted actuating member having a lateral projection extending between said upper and lower finger portions, whereby upon movement of said actuating member in an upward direction, the deadlocking member will be swung upwardly on its pivot to disengage said lower finger portion with respect to said bolt to permit movement of said bolt by said urging means to said retracted position.

4,099,753

AUTOMATIC LOCKING MECHANISM FOR ONE OF A PAIR OF HINGED DOORS

Joseph W. Gwozdz, Clark Summit; James E. Biesecker, Goulds-boro, and Charles R. Snyder, Factoryville, all of Pa., assignors to McKinney Manufacturing Company, Scranton, Pa.

Filed Jan. 24, 1977, Ser. No. 761,687
Int. Cl.² E05C 7/06
U.S. Cl. 292—177 **5 Claims**



4. Automatic locking mechanism for one of a pair of hinged doors having adjacent free vertical edges when both doors are closed, one of the doors being active and the other being inactive, said mechanism comprising a housing adapted to be mounted on the inactive door and including a face plate provided with an opening therethrough, an axially movable vertical shaft slidably mounted in said housing and extending vertically therefrom, a normally retracted latch bolt rigidly mounted on the end of said shaft remote from the housing, a rocker arm having an inner end and an outer end, an inclined link having one end pivotally connected on a horizontal axis to the opposite end of the shaft and extending therefrom away from said face plate, means pivotally connecting the other end of said link on a horizontal axis to the inner end of said arm, means connecting the central part of said arm on a horizontal axis to said housing for pivotal and translational movement, a cam pivotally connected on a vertical axis to said housing and normally projecting through said face plate opening for engagement by the free vertical edge of the active door when closing for swinging the cam into the housing, the cam engaging the outer end of the rocker arm for swinging the arm vertically to cause the link and shaft to project said latch bolt from a horizontal edge of the inactive door, said central part of said arm being movable by the cam in a direction away from the face plate if the cam is swung into the housing and the shaft cannot move, and spring means constantly urge said pivoted central part of the arm toward the face plate.

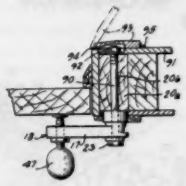
4,099,754

DOOR SECURITY GUARD

Robert J. Hoebing, RR 3, Quincy, Ill. 62301

Filed Jul. 8, 1977, Ser. No. 813,936
Int. Cl.² E05C 5/04
U.S. Cl. 292—206 **2 Claims**

1. A door security latch comprising an attachment member for attachment of the latch to a door frame adjacent a door opening having a projecting portion adapted to project beyond the door frame, a link member having a free end and an attachment end, the attachment end pivotably attached to the projecting portion with the link pivotable in a plane substantially normal to the plane of projection of the projecting portion, the free end having a threaded connection to a threaded member, the threaded member having a longitudinal axis of projection substantially normal to the plane of pivotability of the link, the threaded member having one end thereof terminating in a door abutment face and a second end thereof, lying on a side of the link opposite the door abutment face terminating in an actuating handle, rotation of the actuating handle causing the abut-



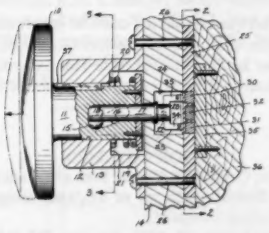
ment face to withdraw towards the link and to advance away from the link, and the link having a length sufficient to place the abutment face in opposition to an inside surface of a door closing said door opening, the handle means having a light carried thereby and means activating said light only when said abutment face is in engagement with said door surface.

4,099,755

RELEASABLE MAGNET ASSEMBLY

Keith J. Anderson, 5049 Guerin Pass, New Berlin, Wis. 53151

Filed Dec. 10, 1976, Ser. No. 749,355
Int. Cl.² E05C 17/56
U.S. Cl. 292—251.5 **12 Claims**



1. A releasable latch comprising:
- a strike plate of high magnetic permeability adapted to be mounted on one of a door and the frame of the door;
- a magnet mounted for rotation in the other of said door and door frame and having spaced poles;
- an intermediate member secured to said other of said door and door frame and disposed between said magnet and said strike plate,
- said intermediate member including ferromagnetic means acting as an extension of said poles when said magnet is in one relative angular position with respect to said intermediate member and acting as a shunt when said magnet and said intermediate member have been rotated through an arc relative to each other;
- means for rotating one of said intermediate member and said magnet relative to the other through said arc, said rotating means having an axis of rotation normal to said intermediate member and said magnet poles being disposed on opposite sides of said axis of rotation; and
- a layer of low friction material disposed between said magnet poles and said ferromagnetic means.

4,099,756

LATCH ASSEMBLY

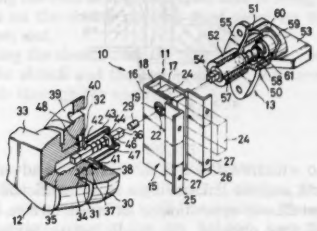
Tetsuro Kagoura, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 25, 1977, Ser. No. 781,324

Claims priority, application Japan, Mar. 26, 1976, 51-33955

Int. Cl.[2] E05C *3/10*

U.S. Cl. 292—336.3 **16 Claims**



1. A latch assembly for use on a closure frame member, comprising:

(a) a support frame having means for being attached to the closure frame member;

(b) a hollow shaft mounted in said support frame for rotation about a longitudinal axis thereof;

(c) a latch bolt fixed at one end thereof to said hollow shaft and extending radially from said hollow shaft, said latch bolt being angularly movable about said axis between a first position in which said bolt is retracted within said support frame and a second position in which said bolt has the opposite end projecting outwardly from said support frame;

(d) a casing having means for being attached to the closure frame member, said casing having a bore;

(e) a handle having a shaft rotatably disposed in said bore; and

(f) a driver torque bar having one end mounted coaxially in said handle shaft for corotation therewith, said driver torque bar having the opposite end extending into said hollow shaft in driving engagement therewith.

4,099,757

DOOR CATCHES

John P. Palmer; Colin W.F. Clinch, both of Woodley, and David N. Harley, Bournemouth, all of England, assignors to ITW Limited, Windsor, England

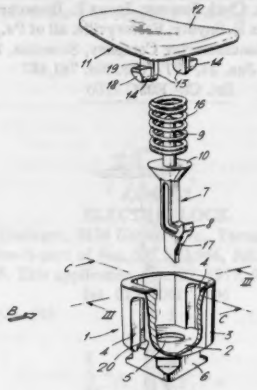
Filed Mar. 28, 1977, Ser. No. 782,254

Claims priority, application United Kingdom, Mar. 30, 1976, 12674/76

Int. Cl.[2] E05C *3/30*

U.S. Cl. 292—336.3 **8 Claims**

1. A four piece door catch assembly for mounting on the door of a cabinet or the like to cooperate with a ledge or the like on a complementary cabinet including an elongated latching element, a housing having integral means for mounting said housing on a workpiece, and an operating element, the latching element being mounted in the housing on a first axis, said housing presenting a centrally located aperture for cooperation with an operating element, the operating element being operated within said housing both for motion between an operative position when located on said first axis and to an inoperative position when tilted away from the first axis, said operating element having a hook-shaped terminal end located beyond and cooperatively engaging an undersurface radially outwardly of the margin of the aperture presented by said latching element, the operating and latching elements being urged apart by a spring biasing means oriented on said first axis and cooperating engaging means being provided on the operating and latching elements consisting of a spigot and socket arrangement respectively, the engaging means being so arranged that when the operating element is in the operative



position rotation of the operating element causes the latching element to rotate.

4,099,758

CLOSURE CONSTRUCTION HAVING ADJUSTABLE CATCH ASSEMBLY

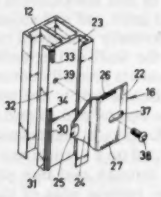
Yukio Yamamoto, and Masami Sakashita, both of Kurobe, Japan, assignors to Yoshida Kogyo, K.K., Tokyo, Japan

Filed Jan. 28, 1976, Ser. No. 653,007

Claims priority, application Japan, Feb. 5, 1975, 50/17355[U]; Apr. 23, 1975, 50/55962[U]

Int. Cl.[2] E05C *13/00*

U.S. Cl. 292—341.18 **10 Claims**



1. A closure construction having an adjustable catch assembly for retaining the closure construction in a closed position, comprising:

(a) a pair of relatively movable closures each having a meeting stile;

(b) a cam assembly having a base secured to one of said meeting stiles and a cam rotatably mounted on said base and including a cam surface;

(c) a cam keeper having a body portion, an extension extending from said body portion and terminating in a keeper detent, said detent being directed toward said one meeting stile and engageable by said cam surface, said body portion having an oblong aperture elongated in the direction of closure movement;

(d) fastening means extending through said oblong aperture and adjustably securing said cam keeper to the other meeting stile; and

(e) interfitting means on said body portion of said cam keeper and on said other meeting stile for positively fixing their relative position in said direction of closure movement and extending transversely to said direction, said interfitting means being a plurality of equally spaced-apart recesses defined in each of the longitudinal edges of said body portion of the cam keeper, and a pair of projections

formed integrally with said other stile and received in a selected pair of said cut-away recesses in the longitudinal edges.

4,099,759

ENERGY ABSORBING BUMPER SYSTEM

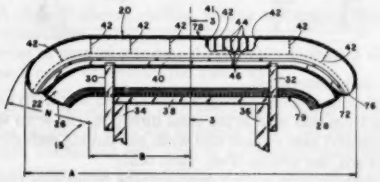
Murray Kornhauser, Wynnewood, Pa., assignor to Safety Consultants, Berwyn, Pa.

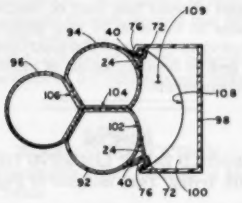
Continuation of Ser. No. 687,513, May 18, 1976, which is a continuation of Ser. No. 430,667, Jan. 4, 1974, Pat. No. 3,971,583, which is a continuation-in-part of Ser. No. 126,155, Mar. 19, 1971, Pat. No. 3,810,668. This application Nov. 26, 1976, Ser. No. 745,419

The portion of the term of this patent subsequent to Jul. 27, 1993, has been disclaimed.

Int. Cl.[2] B60R *19/10*

U.S. Cl. 293—71 P 20 Claims





1. A bumper apparatus for a vehicle comprising:

(a) a flexible bag structure having a flexible exterior walls forming a cavity for containing a gas compressed under impact to a substantial pressure to absorb the energy of a collision of said vehicle applied over an impact portion of said exterior walls,

(b) means for attaching said bag structure to a vehicle with said impact wall portion in a generally upright orientation; said bag structure including means for forming said exterior walls to have a certain shape in opposition to said gas pressure so as to limit the stroke of said walls under impact, said exterior wall forming means including load bearing means connected along said exterior walls and between a plurality of spaced fixed parts of said bag attaching means, said load bearing means including flexible webs shaped such that substantially all of the web material is in tension when the flexible cavity is pressurized and having an opening for gas flow past said webs under impact;

(c) and means for controlling the gas pressure in said bag structure including means for controlling gas flow out of said bag structure upon the application of pressure thereto under impact.

4,099,760

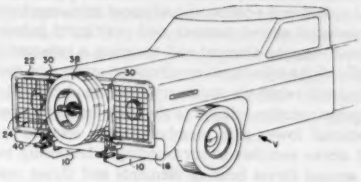
GRILL AND BRUSH GUARD AND UTILITY RACK FOR A VEHICLE

Lawrence L. Mascotte, and Robert L. Rayson, both of 9106 SE. 82nd, Portland, Oreg. 97266

Filed May 5, 1977, Ser. No. 793,979

Int. Cl.[2] B60R *19/00*

U.S. Cl. 293—73 4 Claims



1. A grill and brush guard for use on a front end of a vehicle comprising:

mounting means adapted to be secured to the frame means of the vehicle;

down stop means and up stop means provided on said mounting means;

frame means having grid wire means secured thereto and hinge means provided thereby;

pivot means securing said hinge means to said mounting means so that said hinge means engages said up stop means when said frame means is in an up position and said hinge means engages said down stop means when said frame means is in a down position; and

securing means engaging and directly linking said frame means and said up or down stop means thereby securing said frame means in said up or down position.

4,099,761

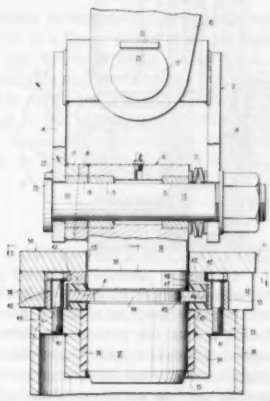
SUSPENDED MATERIAL HANDLING UNIT

Harold L. Cullings, R.D. 1, Box 66, McConnellsburg, Pa. 17233

Continuation-in-part of Ser. No. 632,667, Nov. 17, 1975, Pat. No. 4,005,895. This application Nov. 18, 1976, Ser. No. 742,881

Int. Cl.[2] B66C *1/00*

U.S. Cl. 294—86 R 8 Claims



1. A suspended material handling unit comprising a relatively stationary shaft member having a lower end cylindrical portion, means to suspend the relatively stationary shaft member along a vertical axis in free swinging relationship to a movable overhead support, a rotational sleeve member having telescoped engagement with the lower end cylindrical portion of said relatively stationary shaft member, a first thrust bearing element interposed between the telescoped members, a thrust

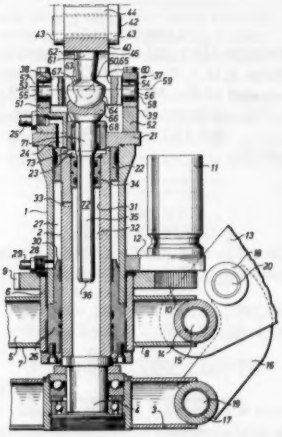
reaction plate below said first thrust bearing element and being fixedly secured to said relatively stationary shaft member, a second thrust bearing element below said reaction plate and between the reaction plate and an opposing face of said rotational sleeve member, a thrust bearing retainer element above said first thrust bearing element and surrounding said relatively stationary shaft member and being secured to an opposing face of said rotational sleeve member, lateral rotational bearing means coaxial with and interposed between said lower end cylindrical portion and adjacent telescoped portion of said rotational sleeve member and positioned below said second thrust bearing element and spanning a substantial distance axially of the telescoped members, an upper stop member surrounding said relatively stationary shaft member and locked thereto against rotation relative to the shaft member, a cooperative rotational lower stop member fixedly secured to said rotational sleeve member in surrounding relationship to said first and second thrust bearing elements and thrust reaction plate and also constituting said thrust bearing retainer element and adapted to contact said upper stop member for restricting relative rotational movement between said shaft an sleeve members in opposite directions, and material lifting and transporting means on the lower end of said rotational sleeve member.

4,099,762

GRIPPING DEVICE

Gustaf Matteus Hultdin, and Ove Anders Hultdin, both of Malå, Sweden, assignors to Hultdins Verkstads AB, Malå, Sweden

Filed Dec. 15, 1976, Ser. No. 750,691
Claims priority, application Sweden, Jan. 22, 1976, 7600642
Int. Cl.[2] B66C *1/00*
U.S. Cl. 294—88 **25 Claims**



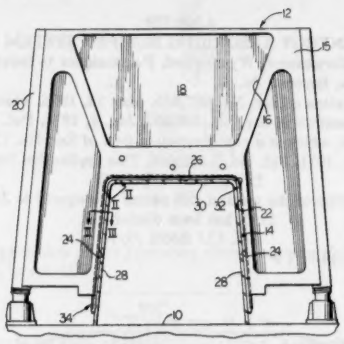
1. Apparatus comprising a gripping device, having claws for holding material, pressure medium actuated means to move said claws including at least one pressure chamber, and a pivotal joint to suspend said device including means for instantaneously stiffening the said pivotal joint temporarily to prevent pivotal movement thereof on actuation of said claws, a pressure rod, means to subject said pressure rod to pressure from said pressure medium from said at least one pressure chamber, a support facing the pressure rod and with which said pressure rod engages to instantaneously stiffen said joint, said pivotal joint comprising a first stand member, a junction member pivotally connected to the first stand member, a second stand member pivotally connected to the junction member, a support member extending from the second stand member, said junction member defining a central opening through which the support member extends, the support member cooperating with the pressure rod.

4,099,763

SEAL CONSTRUCTION FOR VEHICLES

Roger F. Maier, Peoria; Jimmy L. Milligan, Pekin; William A. Bahnfleth, East Peoria, and James L. Taylor, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1976, Ser. No. 746,568
Int. Cl.[2] B62D *27/00*
U.S. Cl. 296—28 C **10 Claims**



9. A seal comprising:

a. a metallic channel having a base, spaced side walls extending from said base in the same direction, and arms spaced from said base on said side walls and having ends directed toward, but spaced from, each other;

b. a resilient strip having opposed tabs removably captured in said channel and extending therefrom for engagement with an element to be sealed,

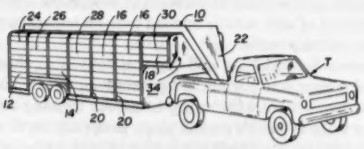
c. whereby said channel base may be welded to a metallic element prior to insertion of said resilient strip in said channel to obviate the need for aligned openings for securing means and/or bonding agents of dubious reliability in varying environments.

4,099,764

OVERHEAD DOOR LOCKING DEVICE

Roger D. Ratliff, Irving, Tex., assignor to PepsiCo Inc., Purchase, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,419
Int. Cl.[2] B60R *7/08*
U.S. Cl. 296—24 R **9 Claims**



7. In a locking device for locking at least one overhead door in a downwardly closed position, a plurality of articulated operatively interconnected levers; a stationarily positioned mounting element; means for locking said door responsive to predetermined manipulation of said levers; and a tension spring biasing means, operatively interconnecting a pivot between two of said articulated, operatively interconnected levers and said stationarily positioned mounting element, for effecting an over-the-center movement between a first position of the spring, wherein the tension spring urges the levers into first positions to lock said door into a fully closed locked position, and a second position of the spring wherein the tension spring

urges the levers into second positions wherein the door is unlocked.

4,099,765

CHANNEL-SHAPED GUIDING, SEALING AND FINISHING STRIPS

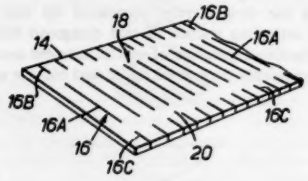
Robert G. Bright, Viersen, Germany, assignor to Draftex Development AG, Switzerland

Filed Sep. 13, 1976, Ser. No. 722,541

Claims priority, application United Kingdom, Sep. 19, 1975, 38643/75

Int. Cl.[2] E06B 7/18, 7/22

U.S. Cl. 296—93 11 Claims



1. A channel-shaped guiding, sealing or finishing strip structure, comprising

a series of parallel side-by-side generally U-shaped elements each made of resilient flat metal strip,

short resilient metal connecting links integral with and connecting the elements so that the latter define a channel,

those regions of adjacent elements which are connected by each connecting link lying in a common plane and each connecting link being kinked or corrugated so as to curve out of the then back into the said common plane, and each connecting link being of reduced thickness as compared with the thickness of the elements in regions thereof immediately adjacent the said regions that are connected by the connecting links, and

a channel-shaped covering of flexible material on at least the outward surfaces of the elements and links.

4,099,766

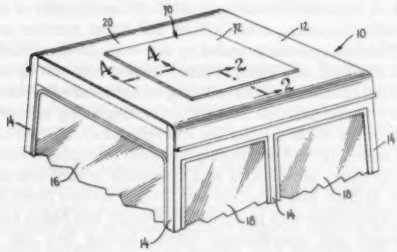
ROOF CONSTRUCTION

Leo J. Lorenz, Farmington, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Jul. 21, 1977, Ser. No. 817,873

Int. Cl. B60j 7/18

U.S. Cl. 296—137 B 10 Claims



1. A roof construction for a tractor cab or the like characterized by:

a primary roof construction provided with a generally rectangular opening defined by a border, opposed portions of the border being provided with retaining lips which extend downwardly and towards each other; and

a secondary roof construction having a peripheral portion adapted to overlie said border, said secondary roof construction being provided with opposed spaced apart retaining means which normally engage said opposed retaining lips to hold the peripheral portion in sealing engagement with the border, the opposed retaining means being swingable towards and away from each other, each of said opposed retaining means including an arm swingable between a downwardly and outwardly extending normal retaining position and a release position, means mounting one end of the arm on the secondary roof construction to facilitate its movement between retaining and release positions, and manually engageable means carried by the other end of the arm and normally in engagement with an associated retaining lip in an overcenter relationship when the retaining means are in their normal engaging position.

4,099,767

FASTENING OF THE INNER ROOF COVERING OF MOTOR VEHICLES

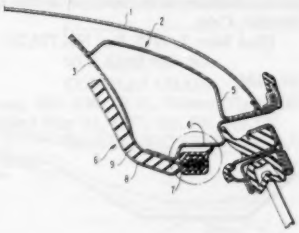
Siegmund Kania, Sindelfingen; Gerhard Zweigart; Karl Luz, both of Aidlingen, and Edgar Lutz, Althengstett, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 31, 1974, Ser. No. 475,177

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1973, 2328173

Int. Cl.[2] B60J 7/00

U.S. Cl. 296—137 A 18 Claims



1. A fastening arrangement for an inner roof covering of motor vehicles at a flange means of a roof frame means, characterized in that the flange means points outwardly and terminates in a substantially horizontally extending edge portion disposed at the periphery of a body opening of the vehicle, and that the edge of the roof covering which is constructed approximately U-shaped surrounds the horizontally extending edge portion so as to secure the roof covering at the flange means.

4,099,768

CONVERTIBLE SEAT-BED UNIT

James Amos, Box 2625, Muncie, Ind. 47302

Filed Jul. 30, 1976, Ser. No. 710,277

Int. Cl.[2] A47C 13/00

U.S. Cl. 297—63 3 Claims

1. A convertible seat-bed unit including a base frame and seat and back sections moveably mounted on said frame for horizontal shifting and for angular shifting of said back section between erect and horizontal positions, wherein the improvement comprises:

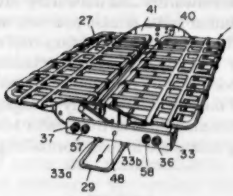
side plates mounted at the opposite sides of said sections and disposed with side plates of said seat section closely overlapping the side plates of said back section on each side of said seat unit;

pivot means interconnecting said side plates on each side of said unit;

a link on each side of said unit pivotally connected at one

end to said frame, and at the opposite end to one of said overlapped side plates; and

locking means moveably mounted in said base frame, and including members adapted to interengage with said side plates at positions spaced from the axis of pivotal interconnection thereof, and from the axis of pivotal connection of



said link means to said one side plate, to secure the angular relationship of said seat and back sections, and secure said sections with respect to said frame, said locking means including a guideway bracket mounted on said frame, and an elongated bolt axially slideably mounted in said bracket.

4,099,769

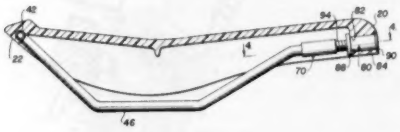
APPARATUS FOR ADJUSTING TENSION IN A BICYCLE SADDLE

David L. Jacobs, Boulder, Colo., assignor to The Jacobs Corporation, Boulder, Colo.

Filed Mar. 7, 1977, Ser. No. 775,231

Int. Cl.[2] B62J *1/10*

U.S. Cl. 297—204 **6 Claims**



1. An apparatus for adjusting tension in an elongated bicycle saddle wherein said saddle includes a narrow leading end portion with a downwardly contoured tip and a wider trailing end portion with a downwardly extending anchor, said apparatus comprises:

frame means underlying and connected to said bicycle saddle for operably supporting said saddle upon a bicycle saddle post, said frame means including

a first portion extending in abutting contact with the downwardly extending anchor of said bicycle saddle; and

a generally U-shaped contoured tubular member including;

a flaired portion defining said first portion extending in abutting contact with said downwardly extending anchor,

a pair of generally parallel mounting runs for connection to said bicycle saddle post, and

generally parallel, spaced, end portions extending toward said downwardly extending tip of said bicycle saddle for engagement with said adjustment bearing means;

an adjustment bearing means connected to a second remote portion of said frame means and extending in proximity to but spaced from the downwardly contoured tip of said bicycle saddle; said adjustment bearing means including

a generally solid yoke member including,

a pair of parallel wells on one end thereof to receive in frictional engagement said parallel, spaced end portions of said tubular U-shaped frame means, and

a bearing well on the other end thereof to receive in abutting contact said adjustment means;

thrust bearing means extending through said downwardly contoured tip portion of said bicycle saddle including

a tubular member having,

a threaded interior surface,

a thrust flange on one end thereof for contacting and bearing against the interior surface of said downwardly contoured tip, and

a retaining flange on the other end thereof for contacting the exterior surface of said downwardly contoured tip and retaining said thrust bearing means in position extending through said downwardly contoured tip of said bicycle saddle; and

adjustment means connected to and extending through said thrust bearing means and in abutting contact with said adjustment bearing means for imparting longitudinal tension between the downwardly contoured tip and the downwardly extending anchor of said elongated bicycle saddle upon selective regulation of said adjustment means through the downwardly contoured tip of said bicycle saddle.

4,099,770

SAFETY DEVICE FOR AUTOMOBILE OCCUPANTS

Joachim Elsholz, Berg; Manfred Bortfeld; Josef Maertz, both of Eching, and Erhard Poser, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 15, 1976, Ser. No. 741,880

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1975, 2551419

Int. Cl.[2] A62B *35/00*

U.S. Cl. 297—216 **9 Claims**

1. A device for retaining a child on the rear seat of an automobile comprising a belt system and a seat member having a seat surface contour bounded by side-walls having perforations therethrough, and being retained on said rear seat by said belt system, characterized by securing means secured to the vehicle body behind said rear seat and extending along at least a portion of the width thereof for slidingly receiving two connecting members, said connecting members extending through said perforations provided in said side-walls of said seat member and, at their ends adjacent said seating surface contour being each provided with pass-through fittings, belt bands extending through said pass-through fittings having first and second sections, said first sections being connectable with one another to form a lap belt, and said second sections extending beyond said pass-through fittings and forming shoulder belts cooperating with a single length-adjusting fittings situated behind a child to be retained, said length-adjusting fitting being connected with the belt band of a retractor through the intermediary of an exchangeable energy absorbing member, and said retractor being secured to the vehicle body.

4,099,771

SEAT ADAPTED TO BE MOUNTED ON VEHICLE TIRE

Robert P. Mathews, 5014 Ampere St., Pittsburgh, Pa. 15207

Filed Jun. 9, 1977, Ser. No. 805,186
Int. Cl.[2] A47C *1/00*
U.S. Cl. 297—217 4 Claims

1. A chair adapted to be mounted on a spare vehicle tire comprising:

(a) a vehicle pneumatic tire mounted on a wheel member with a hub area and a rim which together form a well, the hub area having plurality of stud bolt holes;

(b) a seat member;

(c) a seat base plate mounted on the bottom of the seat member and spaced above the tire member just enough to allow rotational movement of the seat base plate with respect to the tire;

(d) a sleeve and rod assembly in which the rod is engaged within the sleeve and both members slide freely with respect to each other, the length of the assembly being approximately the depth of the well, one end of the assembly is attached to the seat base plate, the other end of the assembly having a flange with a plurality of holes which are aligned with the stud bolt holes in the hub; and

(e) a nut and bolt assembly corresponding to each of the holes in the hub and flange securing the flange to hub.

4,099,772

SEAT RACK WITH A REPLACEABLE HEAD REST COVER

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed Dec. 13, 1976, Ser. No. 749,727
Int. Cl.[2] A47C *31/10*
U.S. Cl. 297—220 6 Claims

1. A replaceable covering for protecting the headrest of a seat, said headrest having a headrest covering material extending from the front to the top transverse edge and providing a rest for the head of a passenger, said covering material being overlapped at the front and at the top transverse edge by front and back covering members, respectively, comprising:

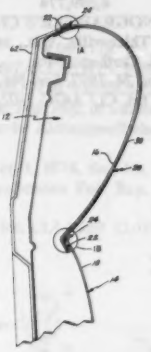
a retainer permanently secured to said headrest adjacent the top transverse edge thereof, said retainer comprising an elongated strip of reverse folded material interposed and secured between the overlapping back member and the top transverse edge of the headrest covering material and defining a retainer through passage;

a sheet material protective cover having a main portion and an upper reverse folded edge defining a cover passage adjacent the upper transverse edge thereof bordering the main portion of said protective cover; and

clasp means insertable in said retainer passage and said protective cover passage for releasably securing said sheet material cover to said headrest, said clasp means comprising:

a first elongated arm;

a second elongated arm joined to and integral with said first arm and extending parallel to and spaced from said first



arm, one of said first and second arms being insertable in said retainer passage and the other arm being insertable in said protective cover passage; and

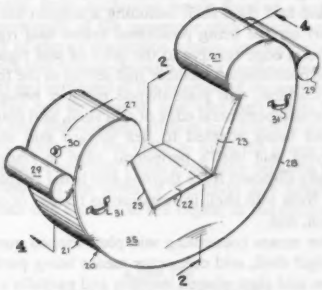
clip means releasably securing one end of said first arm to one end of said second arm, said clip means being located in one of said passages and substantially concealed therein.

4,099,773

COUPLES CHAIR

James F. Chang, 3821 SW. 88 Pl., Miami, Fla. 33165

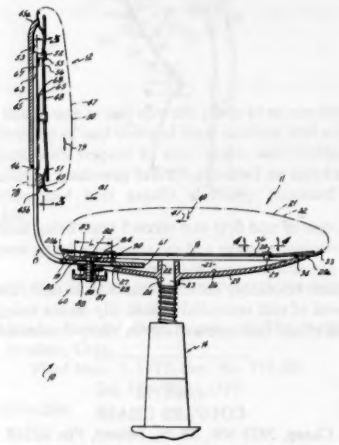
Filed May 31, 1977, Ser. No. 802,127
Int. Cl.[2] A47C *3/02*
U.S. Cl. 297—270 1 Claim



1. In an article of furniture, an inflatable rocking chair including a base section, inclined back sections hingedly connected to said base section, said base section and inclined back sections being hollow, support pieces mounted on said inclined sections and said support pieces having cushions contiguous to the outer surfaces thereof, said chair further including curved end sections and a curved bottom section, cylindrical portions formed integrally with the outer upper end portions of the chair and said cylindrical portions providing stop members for limiting rocking movement of the chair, a fitting provided on said chair so that when the chair is being used, air under pressure can be introduced into the hollow interior of the chair through the fitting, and wherein when the chair is not being used, the air can be let out of the interior of the chair through the fitting so that the chair can be folded to occupy a minimum amount of space for storage and shipment, said chair further

including spaced parallel side portions, and straps secured to said spaced parallel side portions.

4,099,774
STENOGRAPHER'S CHAIR
Edwin C. Sandham, Thiensville, Wis., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Jan. 24, 1977, Ser. No. 761,683
Int. Cl.[2] A47C 7/02
U.S. Cl. 297—298 12 Claims



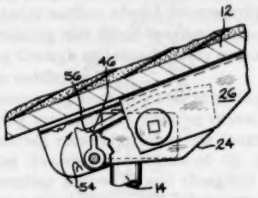
1. A chair having at least one of a seat and backrest, said one of said seat and backrest comprising

a rigid shell, said rigid shell having a peripheral edge configuration generally shaped as said one of said seat and backrest, and said rigid shell including a support surface, said support surface being positioned below said rigid shell's peripheral edge relative to the floor of said rigid shell,

a flexible plate-shaped member that serves as the foundation for a cushion, said plate-shaped member being sized to overlie said peripheral edge of said shell, said plate-shaped member being adapted to flex toward said shell when overlying said shell's peripheral edge in response to a centrally disposed force thereon and being adapted to flex away from said shell in response to release of said force thereon, and

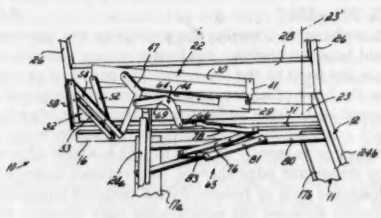
connector means connecting said plate-shaped member and said rigid shell, said connector means being partially carried on said plate-shaped member and partially carried on said shell, that portion of said connector means carried on said plate-shaped member being immobile relative thereto and that portion of said connector means carried on said rigid shell being immobile relative thereto, said connector means being structured to permit connection and disconnection by flexing said plate-shaped member toward said rigid shell and thereafter moving said plate-shaped member relative toward said shell's peripheral edge while retaining said plate-shaped member in the flexed attitude, and said connector means being structured to define a gap between said plate-shaped member and said support surface on said rigid shell when said plate-shaped member and said rigid shell are connected for permitting said plate-shaped member to flex toward said rigid shell when disconnection is desired, thereby permitting said plate-shaped member to be connected in and disconnected from final use position with said rigid shell.

4,099,775
CHAIR CONTROL WITH TILT LOCK
Ned W. Mizelle, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Filed Oct. 7, 1976, Ser. No. 730,161
Int. Cl.[2] A47C 3/026
U.S. Cl. 297—303 1 Claim



1. A chair control comprising a frame structure supportable by a base, seat support means pivotally mounted on said frame structure for tilting movement relative to said frame structure, bias means operatively associated with said frame structure and said seat support means biasing said support means to a normal position relative to said frame structure in all tilted positions of said support means, said seat support means supported on the front of said frame structure in said normal position, a multiposition member comprising a body having a plurality of angularly arranged blocking surfaces, a shaft member the rear of on said seat support means movably supporting said body thereon for movement between frictionally adjusted positions in one of which said blocking surfaces are disengaged from the rear edge said frame structure and another selectible position in a tilted position of said seat support means in which one of said blocking surfaces is engaged with said rear edge of said frame structure so as to block return movement of said seat support means to said normal position while enabling further tilting of said seat support means away from said normal position, and coacting stop means on said body and said seat support means engageable to define a moved position of said body in which said body is in a clearance relation with the rear of said frame structure to allow return movement of said seat support means to said normal position and free rearward tilting movement of said seat means.

4,099,776
CONTROL ASSEMBLY FOR A RECLINING CHAIR
Donald Crum, Louisville; McKinley Goff, Middletown, and Edward L. Hampton, Louisville, all of Ky., assignors to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Mar. 15, 1976, Ser. No. 667,099
Int. Cl.[2] A47C 1/02
U.S. Cl. 297—329 29 Claims



1. In a reclining chair of the type including

a body support mounted on a body support frame, said body support including a chair seat and a chair backrest,

recliner linkage connecting said chair seat and said body support frame to permit limited tilting movement of said chair seat between an upright position and at least one reclining position, said chair seat being tilted in the re-

clined position relative to the chair seat attitude in the upright position, and said recliner linkage being partially mounted on said body support frame, and

a stationary chair base on which said body support frame is carried for forward and rearward motion relative to said chair base, the improvement comprising

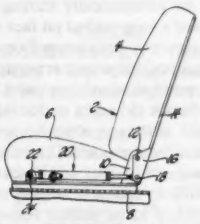
a control assembly directly connected in a mechanical linkage series between said chair base and said recliner linkage assembly, said control assembly also being connected to said body support frame, said control assembly being operative through direct mechanical connection and coaction with said recliner linkage assembly to control forward and rearward movement of said body support frame relative to said stationary base as said chair seat tilts between the upright and reclining positions and said control assembly being entirely positioned beneath said chair seat in all of the upright and reclining positions of said reclining chair.

4,099,777

TELESCOPIC SEAT POSITIONING MECHANISM

Russell F. Chekirda, Morristown, Tenn., assignor to Lear Siegler, Inc., Morristown, Tenn.

Filed May 2, 1977, Ser. No. 792,614
Int. Cl.[2] B60N *1/02*
U.S. Cl. 297—375 30 Claims



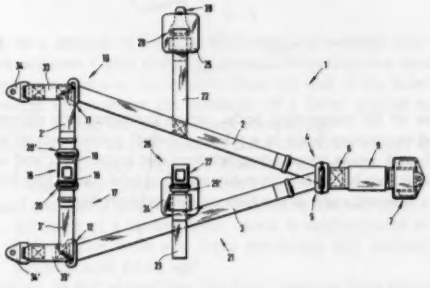
1. Seat positioning mechanism of the type including an elongated housing having a rod slidably received therein for telescopic movement with respect to said housing between extended and retracted positions with friction lock means received in said housing and having a lock position tilted about a fulcrum in frictional engagement with said rod to frictionally restrain said rod against movement with respect to said housing in any selected position between the retracted and extended positions, and an unlock position disposed substantially transverse to said rod and out of frictional engagement with said rod to permit free movement of said rod with respect to said housing, and rod locking and biasing means interconnecting said housing, rod and friction lock means to urge said friction lock means toward the lock position; wherein the improvement comprises a slot formed in the wall of said housing intermediate the ends thereof, said slot having first and second end portions extending transversely of the longitudinal axis of said housing, said first end portion being located on said wall at the outer cross-sectional boundary of said housing so that the fulcrum is spaced from the longitudinal axis of the rod the maximum distance allowed by the cross section of the housing, said first end portion having a central portion defining the fulcrum for said friction lock means, the outer wall of said housing being deformed to form an inwardly depressed portion projecting inwardly from said outer boundary of said housing, said second end portion being located on said inwardly depressed portion; and wherein said friction lock means comprises at least one lock washer having a rod locking opening receiving said rod and a lever arm projecting from its outer periphery into said slot between said first and second end portions thereof for enaging said fulcrum such that the edge of said rod locking opening frictionally engages said rod in the tilted, lock position of said lock washer, said rod locking opening being larger than said rod to permit said free movement of said rod in the transverse unlock position of said lock washer, said central portion of said first end portion that defines the fulcrum being the only portion of said first end portion that contacts said lever arm to minimize lateral cocking of said lock washers about an axis passing through the center of the lock washer and the lever arm thereof.

4,099,778

RETENTION INSTALLATION FOR CHILDREN IN MOTOR VEHICLES

Werner Lehr, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 1, 1976, Ser. No. 728,624
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1975, 2544274
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—386 6 Claims



1. An installation for the retention of a child on seats in motor vehicles, comprising a chest belt means and a lower body belt means, characterized in that the chest belt means is connected with two belt-bands which extend, behind the vehicle passenger, from anchoring means fixed at a vehicle part located rearwardly of the passenger with which they cooperate by way of energy absorption means, downwardly over the backrest of a seat to pass-through fitting means connected with a fixed part and arranged at the junction of the seat surface and backrest, the end sections of said two belt bands being deflected by said pass-through fittings to extend in front of the lower body portion of the child to form the lower body belt means and said chest belt bands extending between the upper body portion and the arms of the child and adapted to be coupled with one another in the region of the child's chest.

4,099,779

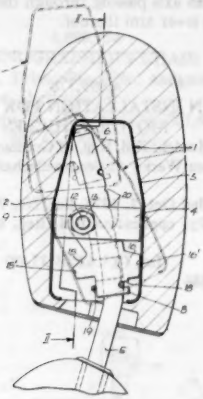
VEHICLE HEAD SUPPORT

Walther Göldner, Ebersbach, Fils, Germany, assignor to Recaro GmbH & Co., Kirchheim, Teck, Germany

Filed Jun. 24, 1977, Ser. No. 809,656
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630281
Int. Cl.[2] A47C *1/10*
U.S. Cl. 297—408 7 Claims

1. In a head support for a vehicle seat, especially for a motor vehicle seat comprising a padded body connected to a vertically non-adjustable fixture secured to the back of the seat, said padded body being vertically and swivelingly adjustable relative to the seat, the improvement comprising said padded body comprising a padded support having a substantially U-shaped cross-sectional profile including front and rear wall portions, spaced bearing walls mounted interiorly of said padded support and extending between the front and rear wall portions thereof, a swivel axle supported between said bearing walls, a

connecting body swivelly mounted on said axle within said padded support, said connecting body having a guide bore therethrough, said fixture including a support bar having an upper terminal portion extending upwardly through the guide



bore of the connecting body, means for adjustably securing said connecting body in a selected swivel position about said axle and means cooperating between said support bar and said connecting body for adjustably securing said connecting body in a selected vertical position on said support bar.

4,099,780

AIRLINE PASSENGER SEAT

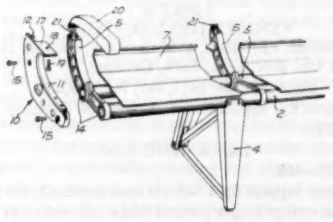
Karl Schmidhuber, Nurtingen-Robdorf, Germany, assignor to Recaro GmbH & Co., Kirchheim, Teck, Germany

Filed Jun. 7, 1976, Ser. No. 693,152

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1975, 7517891[U]

Int. Cl.[2] A47C 7/54

U.S. Cl. 297—411 10 Claims



1. In an airline passenger seat having at least one seat divider, the improvement comprising a filler member affixed to said seat divider, said filler member being formed of hard foam plastic for absorbing loads and stresses in an inherently stable manner and transmitting such loads and stresses to the seat divider and a casing supported by said filler member.

4,099,781

APPARATUS FOR AUTOMATICALLY SHIFTING THE CONVEYOR AT THE PIT FACE IN THE COAL MINE

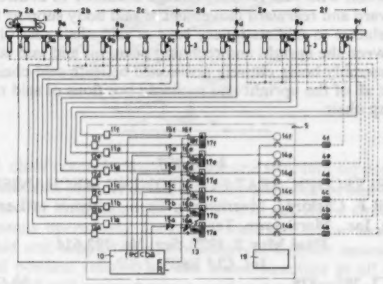
Isao Sawayama, and Hajime Endo, both of Kushiro, Japan, assignors to Taiheiyo Engineering Incorporated, Tokyo, Japan

Filed Apr. 5, 1977, Ser. No. 784,750

Claims priority, application Japan, Sep. 22, 1976, 51-114053

Int. Cl.[2] E21C 35/08

U.S. Cl. 299—1 3 Claims



1. An apparatus for automatically shifting individual conveyor portions toward a long-walled pit face in a coal mine as a shearer on the conveyor progresses from one portion to another, comprising a position sensor arranged in each portion of the conveyor, a position signal generator attached to said shearer, a set of hydraulic cylinders associated with each individual portion of the conveyor, a stroke sensor attached to each set of said cylinders, and control circuit means including a group of electromagnetic valves which act to render operative the set of hydraulic cylinders belonging to each individual portion of the conveyor to be shifted responding to signals transmitted from the position sensor, the position signal generator and the stroke sensor, whereby only that individual portion of the conveyor corresponding to the portion of the pit face which has been already sheared by the shearer is progressively and automatically shifted toward the pit face by the corresponding set of hydraulic cylinders.

4,099,782

CONTROL SYSTEM FOR A MINERAL MINING INSTALLATION

Walter Weirich, Dortmund, and Heinrich Wildförster, Gelsenkirchen-Buer, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 16, 1977, Ser. No. 769,367

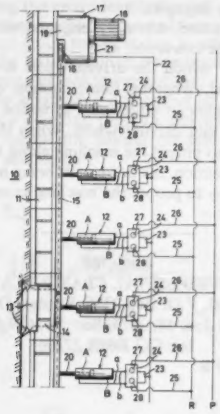
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606394; May 22, 1976, 2623016

Int. Cl.[2] E21D 15/48

U.S. Cl. 299—1 33 Claims

1. In a control system for controlling the thrust applied, by hydraulic rams, to a driven mining winning machine via a guide along which the mining winning machine is movable, the improvement comprising control means which regulates the thrust applied to the guide by the hydraulic rams in dependence upon the loading of the winning machine drive, said control means comprising a transducer for detecting the load-

ing of the winning machine drive and for emitting appropriate control signals, and pressure regulator means associated with



the rams for regulating the thrust applied to the guide by said rams in dependence upon said control signals.

4,099,783

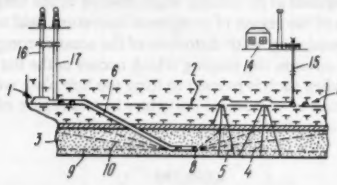
METHOD FOR THERMOSHAFT OIL PRODUCTION

Vladimir Grigorievich Verty, Ukhta, poselok Yarega, ulitsa Kosmonavtov, 4, kv. 29; Pavel Grigorievich Vo onin, Ukhta, poselok Yarega, ulitsa Mira, 4, kv. 6; Evgeny Ivanovich Gurov, Ukhta, poselok Yarega, ulitsa Mira, 2, kv. 3; Vitaly Semenovich Zubkov, Ukhta, poselok Yarega, ulitsa Mira, 4-3; Nikolai Ivanovich Melnichuk, Ukhta, poselok Yarega, ulitsa Mira, 7, kv. 5; Grigory Grigorievich Miller, Ukhta, poselok Yarega, ulitsa Kosmonavtov, 4-59; Vladimir Nikiforovich Mishakov, Ukhta, poselok Yarega, ulitsa Pushkinskaya, 1, kv. 4; Vitaly Stepanovich Sukrushev, Ukhta, poselok Yarega, ulitsa Mira, 2-12; Leonid Mikhailovich Ruzin, Ukhta, poselok Yarega, ulitsa Kosmonavtov, 5, kv. 26, all of Komi ASSR, and Vladimir Pavlovich Tabakov, ulitsa Sofii Kovalevskoi, 4a, kv. 125, Moscow, all of U.S.S.R.

Filed Dec. 5, 1975, Ser. No. 638,027

Int. Cl.[2] E21B *43/24*; E21C *41/10*

U.S. Cl. 299—2 **6 Claims**



1. A method for thermoshaft oil production of viscous oils or fluid bitumens wherein mining openings are provided above an oil-bearing bed at an overburden level comprising forming said mining openings with an inclination of from about 1° to about 3° to the horizon; drilling injection holes from said mining openings for feeding a heating medium into said oil-bearing bed; constructing a slope and a footway from at least one mine opening leading to the bottom part of said oil-bearing bed to a production gallery which is provided within the bottom part of said bed; drilling a system of horizontal and ascending holes for oil production from said production gallery; positively feeding a heating medium into said injection holes for uniform distribution thereof over the entire volume of said oil-bearing bed and for displacement of oil into said horizontal and ascending production holes towards said production gallery; and recovering the oil from said production gallery.

4,099,784

METHOD AND APPARATUS FOR BREAKING HARD COMPACT MATERIAL SUCH AS ROCK

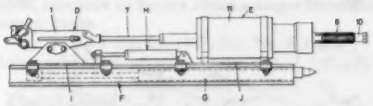
George A. Cooper, Gollion, Switzerland, assignor to Institut Cerac SA., Ecublens, Switzerland

Filed Oct. 12, 1976, Ser. No. 731,316

Claims priority, application Switzerland, Oct. 23, 1976, 13751/76

Int. Cl.[2] E21C *37/02*

U.S. Cl. 299—10 **12 Claims**



1. In a method of breaking hard compact material such as rock adjacent a hole drilled thereinto, comprising first firmly gripping a region of the material from the wall of the hole by a wedge effect under the influence of a force applied to a wedging means; the improvement comprising:

then applying an axial force directed outwardly of said hole to said gripped region of sufficient magnitude to cause breaking and pulling out of said region of material;

said outwardly directed axial force being exerted under the influence of a further force which is unidirectional with but separate from said force producing said outwardly directed axial force; and

taking up and neutralizing the thrust reaction force incident to said outwardly directed axial force by said material.

4,099,785

METHOD AND APPARATUS FOR SUPPORTING THE ROOF OF AN UNDERGROUND MINE WORKING

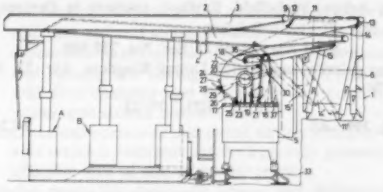
Karl Maria Groetschel, Jakob-Klar-Strasse 5, 80 Munich 40, Fed. Rep. of Germany

Filed Jun. 4, 1976, Ser. No. 693,114

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1975, 2525978; May 3, 1976, 2679509

Int. Cl.[2] E21D *19/00*

U.S. Cl. 299—11 **12 Claims**



1. A method of supporting the roof of an underground mine working in a region newly exposed by the passage of a mining machine along an upright face of the working, comprising:

a. storing a supply of flexible mat in a region which is already supported by self-advancing roof supports,

b. moving said supply of flexible mat along the face of the working, with the mining machine,

c. drawing mat from said stored supply in a first direction generally transversely of the direction of passage of the mining machine,

d. redirecting said mat to extend generally parallel to the direction of passage of the mining machine along the newly exposed roof,

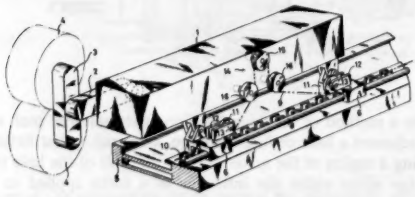
e. pressing said extended mat into contact with the roof by advancing and loading the self-advancing roof supports in said direction generally transversely of the direction of passage of the mining machine.

4,099,786

APPARATUS FOR DRAWING THE SHEARERS

Shigeo Nakajima, Tokyo, and Hajime Endo, Kushiro, both of Japan, assignors to Taiheiyo Engineering Incorporated, Tokyo, Japan

Filed Mar. 7, 1977, Ser. No. 775,141
Claims priority, application Japan, Aug. 31, 1976, 51-116857[U]
Int. Cl.[2] E21C *27/34*
U.S. Cl. 299—43 10 Claims



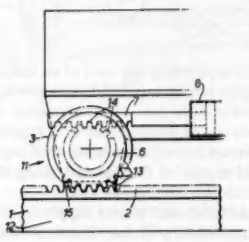
1. Apparatus for drawing shearers along a long-walled pit face of a coal mine comprising a conveyor arranged along the pit face of the coal mine, a shearer mounted to move along said conveyor, cable fixing means arranged along the conveyor, a cable means disposed along said cable fixing means, said cable means being engageable by said cable fixing means to preclude relative longitudinal movement between the cable means and the cable fixing means, driving means on said shearer engaging said cable means to drive said shearer along said conveyor, and guide wheel means on said shearers and engaging said cable means, said guide wheel means guiding the cable means between said driving means and said cable fixing means such that said cable means has an operational cable portion which extends between the cable fixing means and the driving means, whereby when the shearer drawing force is applied by said driving means to said cable means such drawing force is applied only to said operational cable portion.

4,099,787

MINING MACHINE

William Askew, Wakefield, England, assignor to Dresser Europe, S.A., Brussels, Belgium

Filed Apr. 19, 1977, Ser. No. 788,896
Claims priority, application United Kingdom, Apr. 23, 1976, 16699/76
Int. Cl.[2] E21C *29/22*
U.S. Cl. 299—43 9 Claims



1. A conveyor-mounted mining machine including at least two drive units each comprising:

(i) a linearly drivable member,

(ii) double-acting drive means arranged to drive said drivable member selectively in opposite directions,

(iii) a driven wheel with which the linearly drivable member is operatively engaged,

(iv) a driving wheel drivingly engaged with a stationary member of the conveyor, and

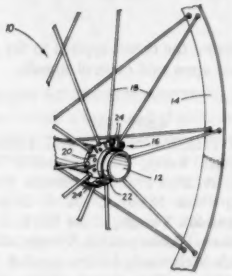
(v) a clutch by which the driven wheel is coupled to the driving wheel, whereby linear motion of said linearly drivable member in either said direction imparts rotary drive to the said driving wheel, when the clutch is engaged, so as to propel the machine along the conveyor in a selected direction, the drive units being operable sequentially whereby to propel the machine continuously along the conveyor.

4,099,788

CURVED METAL CLAMP PLATE

Harold K. Trunnell, P.O. Box 2336, Eugene, Oreg. 97402

Filed Jun. 18, 1976, Ser. No. 697,678
Int. Cl.[2] B60B *27/06*
U.S. Cl. 301—105 R 7 Claims



1. A wheel hub plate pressed from flat metal stock, the plate having a curved outline when viewed in side elevation and also possessing a curved outline in transverse cross-section so as to have throughout a significant portion thereof a region of compound curvature,

apertures in said region of compound curvature for the mounting of spokes in the wheel, and

multiple elongate cutouts in the plate in the region thereof of compound curvature, distributed over such region and interspersed with said apertures, said cutouts having their axes disposed at an oblique angle relative to the longitudinal axis of the region of compound curvature, said cutouts accommodating, with distortion of the areas encompassed by said cutouts, the shaping which occurs in the flat metal stock when such is pressed to form the hub plate with the generation of compound curvature in said region of compound curvature.

4,099,789

DEVICE FOR THE ORIENTED COLLECTION OF STOCKINGS, PANTY-HOSE AND LIKE ARTICLES

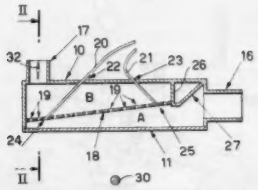
Sergio Zaglio, Castiglione Delle Stiviere (Mantova), Italy, assignor to Calzificio Golden Lady S.a.s. di Grassi Nerino & C., Castiglione Delle Stiviere (Montava), Italy

Filed Dec. 29, 1976, Ser. No. 755,290
Claims priority, application Italy, Sep. 24, 1976, 27652 A/76
Int. Cl.[2] B65G *51/02*
U.S. Cl. 302—2 R 9 Claims

1. Apparatus for the orderly collection of articles such as stockings, panty-hose and the like, in a temporary collection space shorter in length than said article to be collected, and for the subsequent deposit of said articles on a support, comprising

(a) an elongated body inserted in a pneumatic conveyance duct, said body defining a temporary collection space for

one article at a time entering said space from an inlet end thereof;
(b) control means for opening the lower portion of said space along the entire length thereof;
(c) a supporting member arranged beneath said lower portion of said space for receiving in substantially centered position the articles falling downwardly from said space upon opening of said lower portion;
(d) means for originating a dragging air stream within said conveyance duct and through said temporary collection spce and means for cutting off said air stream downstream of said body;



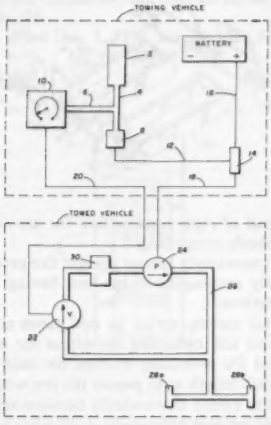
(e) said temporary collection space having a length substantially shorter than the length of said article;
(f) a perforated diaphragm defining the top of said space and arranged at an angle in said body so that said space is progressively narrowed from said inlet end towards the end opposite to said inlet end, whereby the perforations in said diaphragm become pregressively clogged as said article fills said space;
(g) said supporting member being spaced from said lower portion substantially beneath the center thereof and transversely relative to the longitudinal axis of said body.

4,099,790

ELECTRO-HYDRAULIC BRAKE ACTUATING SYSTEM

Larry W. Hipps, 506 Colorado St., Sherman, Tex. 75090

Filed Nov. 18, 1976, Ser. No. 742,854
Int. Cl.[2] B60T *13/68*
U.S. Cl. 303—7 **9 Claims**



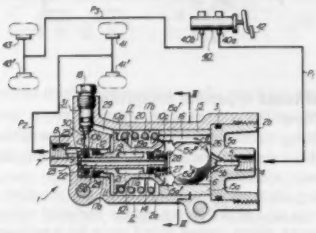
1. A brake actuating system for towed vehicles having hydraulic brakes comprising:
(a) a hydraulic fluid pumping means having an outlet connected hydraulically with hydraulic brakes of said towed vehicle;
(b) reservoir means hydraulically interconnected with the inlet of said pumping means; and
(c) a normally open variable valve means interconnected hydraulically between the inlet of said pumping means and the hydraulic brakes for restricting the flow of fluid from said hydraulic brakes to said reservoir as said valve closes, said variable valve means comprising an electromagnetically controlled valve stem means interconnected to a means for supplying variable electric current to thereby incrementally regulate the flow of fluid through said variable valve means according to the electric current supplied to the electromagnet.

4,099,791

HYDRAULIC BRAKE PRESSURE CONTROL APPARATUS FOR VEHICLES

Tomoyuki Nogami, Toyota, and Takaaki Ohta, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 29, 1977, Ser. No. 820,246
Claims priority, application Japan, Dec. 2, 1976, 51-145142
Int. Cl.[2] B60T *8/093*
U.S. Cl. 303—24 F **9 Claims**



1. An apparatus for controlling hydraulic pressure delivered to hydraulic brake cylinders for rear wheels of a vehicle comprising:
a housing having an inlet port adapted to be hydraulically communicated with a master brake cylinder and an outlet port adapted to be hydraulically communicated with hydraulic brake cylinders for rear wheels;
said housing being composed of a main housing portion having an opening and a plug block fitted into said opening;
a first hydraulic pressure chamber formed in said housing and communicated with said inlet port;
a second hydraulic pressure chamber formed in said housing and communicated with said outlet port;
a communication passage for communicating therethrough said first and said second hydraulic pressure chambers;
a differential piston axially slidably accommodated within said housing and having one end portion located within said first chamber and the other end portion located within said second chamber;
said one end portion of said piston having a smaller effective area which is responsive to the hydraulic pressure than an effective area of said other end portion;
spring means for constantly urging said differential piston toward said second chamber;
an inertia valve element accommodated movably within said housing and adapted to close said communication passage in response to a predetermined deceleration of said vehicle;
means extending through said differential piston for guiding the sliding movement of said piston; and
a sealed air chamber defined between said differential piston and said guiding means;
said sealed air chamber being adapted to be introduced thereinto a hydraulic medium leaked through engaging portions of said differential piston with said guiding means to thereby prevent the hydraulic medium from leaking outwardly from said housing.

4,099,792

BRAKE FORCE CONTROLLER FOR VEHICLES, PARTICULARLY AUTOMOTIVE VEHICLES

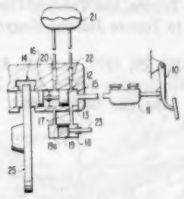
Walter Schmid, Maichingen; Arno Jambor, Vaihingen, both of Fed. Rep. of Germany; Karl Wilfert, deceased, late of Gerlingen-Waldstadt, Fed. Rep. of Germany (by Dorothea Wilfert nee Rischawy, heir), and by Thomas Wilfert, heir, Markgroeningen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 718,764

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1975, 2538700

Int. Cl.[2] B60T 9/10

U.S. Cl. 303—113 13 Claims



1. Wheel brake apparatus comprising:

a pedal-operated master brake cylinder,

brake lining means engageable with a moveable part of a wheel for applying braking forces thereto from said master brake cylinder,

measuring element means for detecting relative movement between said brake lining means and said moveable part,

wheel brake piston means acted upon by a pressure medium supplied by said master brake cylinder and operatively connected with said brake lining means for forcing said brake lining means toward said moveable part in response to a predetermined force on said wheel brake piston means by said pressure medium,

a brake force lock-up preventing controller for automatically changing said predetermined force by said pressure medium in response to the relative movement detected by said measuring element means,

a control piston provided between the master brake cylinder and the wheel brake piston means, the front face of this control piston being exposed to the pressure output of the master brake cylinder, at least portions of the rear face of the control piston being exposed to the pressure acting on the wheel brake piston means,

connection means separate from said control piston for communicating the pressure at said front face directly with said rear face through said lock-up preventing controller, said connection means bypassing the master brake cylinder, and

only a single adjusting piston member means, arranged in said lock-up preventing controller, for controlling flow through said connection means.

4,099,793

ANTI-SKID VEHICLE BRAKE SYSTEM WITH FLUID PRESSURE ACTUATED REGULATING VALVE

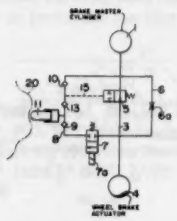
Toshimitsu Iio, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 12, 1976, Ser. No. 713,843

Int. Cl.[2] B60T 8/02

U.S. Cl. 303—116 7 Claims

1. Anti-skid brake system comprising master cylinder means for providing upon actuation a supply of hydraulic brake pressure, wheel brake actuating means, brake pressure supply passage means between said master cylinder means and said wheel brake actuating means, fluid return passage means between said master cylinder means and said wheel brake actuating means for return of hydraulic fluid, control valve means for opening when actuated said wheel brake actuating means to said fluid return passage means, skid control means for actuating said control valve means upon detection of skidding so that the wheel brake actuating means is opened to the fluid return passage means, fluid return pump means provided in said fluid return passage means for return of said hydraulic fluid through said passage means, first check valve means provided between the return pump means and the wheel brake actuating means to allow fluid flow only toward the pump means, second check valve means provided between the return pump means and the master cylinder means to allow fluid flow only toward the



master cylinder means, fluid pressure actuated regulating valve means for introducing upon actuation a restriction to the brake pressure supply passage means, valve actuating fluid passage means provided between the fluid return pump means and the regulating valve means, third check valve means which is disposed between said fluid return pump means and the second check valve means and allows fluid flow only toward the second check valve means, said valve actuating fluid passage means being connected with said fluid return passage means at an area between said second and third check valve means.

4,099,794

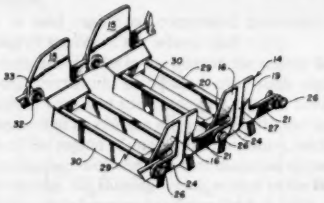
TRACK PAD

Ronald J. Hoffart, Box 124, Casselton, N. Dak. 58012

Filed Mar. 22, 1976, Ser. No. 668,822

Int. Cl.[2] B62D 55/20

U.S. Cl. 305—13 16 Claims



1. A track pad of rigid construction for use with vehicles having tired wheels comprising:

(a) a pair of transversely spaced upright tire protector plates of generally rectangular shape and having leading and trailing portions;

(b) grouser bar means carried by said plates at their lower end portions and extending therefrom for engaging the ground and for providing traction for such wheels and being of such length as to permit the tire with which it is to be used to extend downwardly between said plates and engage said grouser bar means;

(c) a rigid link carried by one of said leading and trailing portions of each of said plates in essentially fixed relation thereto and extending outwardly from the lower portion thereof for connection to another track pad, said link having an aperture therein adapted to receive a pivot pin therein to accomplish such a connection, and

(d) clevis means carried by the other of said leading and trailing position of each of said plates in essentially fixed

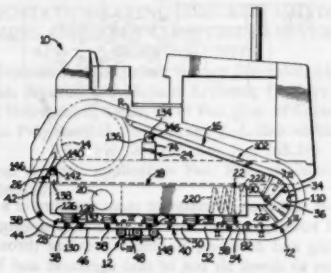
relation thereto for pivotally connecting the same to the link of an adjacent track pad and adapted to receive such a rigid link to another track pad and a pivot pin therein for connection to such other track pad.

4,099,795

TRACK-TYPE VEHICLE UNDERCARRIAGE

Robert D. Roley, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 8, 1977, Ser. No. 814,234
Int. Cl.[2] B62D *55/10, 55/30*
U.S. Cl. 305—18 5 Claims



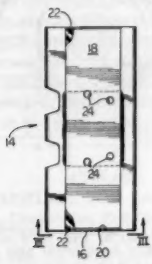
1. A track-type vehicle undercarriage, comprising:
a segmented track support rail;
a recoil member operably connected to the rail;
a first portion of the support rail including a plurality of pivotally interconnected segments;
a second portion of the support rail including an arcuate segment slidably interconnected with the first portion and pivotally connected to the recoil member; and
a third portion of the support rail slidably interconnected with the second portion and pivotally connected to the recoil member.

4,099,796

VIBRATION DAMPED SHOE ASSEMBLY

Eugene R. Groff, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1976, Ser. No. 746,567
Int. Cl.[2] B62D *55/28*
U.S. Cl. 305—46 10 Claims



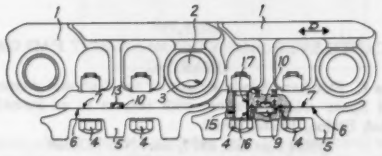
1. In a shoe assembly having a shoe having opposed first and second surfaces, a cover plate generally covering the shoe, and viscoelastic material positioned between the shoe and the cover plate, the improvement comprising:
said shoe and cover plate each having first and second end portions and a middle portion and including:
a seat on the middle portion of one of the cover plate and shoe, said seat contacting the middle portion of the other of said cover plate and shoe with the first and second end portions of the cover plate each spaced a preselected distance from the respective first and second end portions of the shoe and having viscoelastic material between the first and second end portions of the shoe and cover plate in the installed position of the cover plate on the shoe.

4,099,797

ENDLESS TRACK FOR VEHICLE

Michel Edouard Grzesik, Crepy-en-Valois, France, assignor to Societe Anonyme POCLAIN, Belleville, France

Filed Oct. 14, 1976, Ser. No. 732,332
Claims priority, application France, Oct. 29, 1975, 75 33098
Int. Cl.[2] B62D *55/28*
U.S. Cl. 305—54 3 Claims



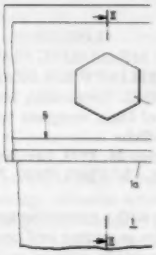
1. An endless track for a public works machine comprising a chain having a plurality of links, separate tiles respectively associated with said links, a plurality of bolts securing said tiles to said links, said tiles and links having recessed housings formed therein opening towards and in axial alignment with each other when the tiles are secured to the links, and at least one anchoring member, separate and independent from the bolts positioned between and extending perpendicularly to the adjacent faces of its associated tile and link and penetrating into said recessed housings in said link and tile, said anchoring member being a solid element formed as a disc having opposite faces being received in the recessed housing of one of said tile and link and a tenon extending from one of its faces out of the disc housing into the housing in the other of said tile and link elements.

4,099,798

STRIPPER DEVICE FOR GUIDE TRACKS ON TOOL MACHINES

Dietmar Steinmetz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed Oct. 27, 1976, Ser. No. 735,976
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550790
Int. Cl.[2] F16C *21/00*
U.S. Cl. 308—3.5 8 Claims



1. A stripper device for guide tracks on a tool machine for fastening to a movable part which moves back and forth on the guide track, comprising
a stripper ledge of a wear resistant elastic material forming

an anchoring stay, the latter having an upper end formed with an anchoring head means thereon, said stripper ledge having a stripper sealing lip compressively resiliently abutting the guide track,

a fastening ledge having an upper end engaging the movable part of the tool machine and a lower end, the latter forming on a front side thereof a groove, said fastening ledge further having a rear side defining an open channel, the latter having an undercut opening at an upper end of said open channel,

said stripper ledge including a rearwardly directed projection which projects into said groove, and

said anchoring head means for engaging in said undercut opening, with said stripper ledge being clamped under said fastening ledge.

4,099,799

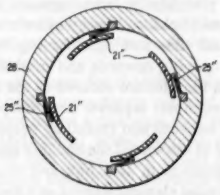
CANTILEVER MOUNTED RESILIENT PAD GAS BEARING

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Izhak Etsion, Haifa, Israel

Filed Apr. 28, 1977, Ser. No. 792,069

Int. Cl.[2] F16C *17/00*

U.S. Cl. 308—5 R **4 Claims**



1. A gas bearing comprising;

first and second elements movable relative to one another and positioned to form a spacing therebetween; and

resilient bearing means disposed within the spacing for deflecting in response to a pressure distribution established by the relative movement of the first and second elements, the resilient bearing means including

a resilient cantilever beam extending in the direction of said relative movement being rigidly mounted at one end to the first element; and

a pad rigidly mounted along a line parallel to its trailing edge to the other end of the cantilever beam and having a substantially smooth surface facing said second element for receiving the load pressure of the bearing, said line being in a plane substantially perpendicular to the direction of said relative movement.

4,099,800

COORDINATE MEASURING MACHINE HAVING AUXILIARY AIR BEARING

Frederick Koonce Bell, Centerville, and John Joseph Tuss, Englewood, both of Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed May 26, 1977, Ser. No. 800,668

Int. Cl.[2] F16C *17/00, 29/02*

U.S. Cl. 308—6 R **14 Claims**

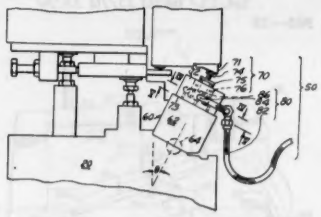
1. In combination with a measuring apparatus having a base, a carriage, means for mounting said carriage to said base for movement of the carriage relative to said base, said means including a plurality of bearings for supporting the carriage during movement, the improvement wherein at least one of said bearings for supporting said carriage is a bearing assembly comprising:

mechanical bearings means for supporting said carriage in a first direction and for allowing said carriage to move in a second direction; and

air bearing means for supporting said carriage in the first direction and for allowing the carriage to move in the second direction said air bearing means including:

a rail mounted to one of said base and carriage and extending in said second direction; and

a housing carried on the other of said carriage and said base, said housing having a plurality of passages connected



together and each terminating in an aperture in a surface of said housing in contact with said rail, and means for receiving and directing air under pressure through said passages to direct air out of said apertures and between said surface of said housing and said rail for creating an air cushion and an air force therebetween, whereby the air cushion between said rail and said surface allows the movement of the carriage in said second direction relative to the base with reduced friction on the mechanical bearing means.

4,099,801

HEAVY-DUTY HYDROSTATIC BEARING

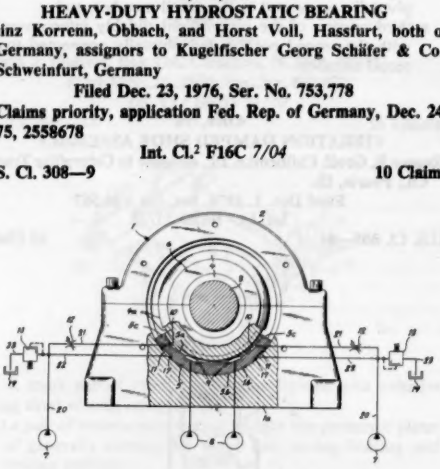
Heinz Korrenn, Obbach, and Horst Voll, Hassfurt, both of Germany, assignors to Kugelfischer Georg Schäfer & Co., Schweinfurt, Germany

Filed Dec. 23, 1976, Ser. No. 753,778

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558678

Int. Cl.[2] F16C *7/04*

U.S. Cl. 308—9 **10 Claims**



1. A hydrostatic journal bearing comprising:

a ring with a generally horizontal axis engageable with a shaft to be journaled in the bearing;

a ring-segmental shell underneath said ring having a concave surface closely juxtaposed with part of an outer surface of said ring and substantially coaxial therewith, said shell extending about said axis over a portion of a circle and terminating in a pair of transverse edges substantially parallel to said axis;

a base having an upper surface supporting said shell, the latter having a convex surface resting on said upper surface, at least one of said convex and upper surfaces being provided with a lower pocket of limited peripheral extent

in the vicinity of each of said transverse edges, said concave surface being provided with a plurality of upper pockets opening onto said outer surface; and

pump means communicating with said pockets for delivering a high-pressure fluid to said upper pockets under a pressure sufficient to prevent direct contact between said concave and outer surfaces and to said lower pockets under a localized pressure resiliently deforming said shell to control the separation of said concave surface from said outer surface at said transverse edges.

4,099,802

HYDROSTATIC BEARING UNIT AND A HYDROSTATIC BEARING ASSEMBLY COMPRISING SEVERAL SUCH BEARING UNITS

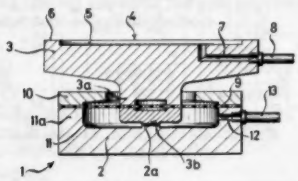
Otto Heinemann, Ennigerloh; Werner Schossler, Ahlen; Helmut Lucke, Neubeckum; Helmut Krumme, Liesborn, and Burkhard Heiringhoff, Celde, all of Fed. Rep. of Germany, assignors to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Feb. 3, 1977, Ser. No. 765,244

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604889

Int. Cl.² F16C *7/04*

U.S. Cl. 308—9 **19 Claims**



1. In a hydrostatic bearing unit for rotating parts, more especially a radial bearing unit for heavy machine parts, such as drums, comprising a fixed base, a bearing shoe supported above said base for limited gyration with respect to said base and for hydraulic adjustment with respect to the rotating machine part and which comprises a bearing surface at the top surface of said bearing shoe fed with hydraulic carrier medium; the improvement therein comprising said base defining a hydraulic chamber, said bearing shoe including a pin extending into said hydraulic chamber toward engagement with the inner portion of said hydraulic chamber, a supporting membrane extending over said hydraulic chamber and connected to said base and to said pin, conduit means in communication with said hydraulic chamber for pressurizing said chamber and supporting said membrane and said bearing shoe on a body of hydraulic fluid with the pin of said bearing shoe out of engagement with the inner portion of said hydraulic chamber whereby the bearing shoe is free to gyrate with respect to said base.

4,099,803

ROLLER CARRIAGE FOR LARGER BEARINGS

Bernhard Knappe, Gochsheim, Fed. Rep. of Germany, assignor to Roland Kamm, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,827

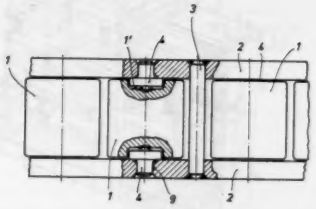
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2608308

Int. Cl.² F16C *33/34, 33/52*

U.S. Cl. 308—215 **4 Claims**

1. A roller carriage for larger bearings comprising a number of rollers having end portions and having recesses each with an inner cylindrical surface portion, said recesses being on the end portions of each roller, a cage which comprises two cage-ring sections which are provided with boreholes, spacer bolts connecting said cage-ring sections with one another, and pins inserted into the boreholes of the cage-ring sections, said pins inserted into the boreholes of the cage-ring sections, said pins extending into the recesses of the rollers,

the portion of each one of said pins which extends into one of the recesses of one of the rollers has a frontal portion which faces the roller and a cylindrical surface with a radius and is provided with a convex projection which is concentric to said one pin; said projection has a radius and serves for axial guidance of said roller, while radial guid-



ance of said roller is made between the cylindrical surface of said one pin and the inner cylindrical surface portion of said one recess of said one rollers, each of said recesses of the rollers comprises a cylindrical pocket borehole which is provided with a spherical depression concentric to the roller axis in which said convex projection rests and said radius of said projection is less than the radius of said cylindrical surface.

4,099,804

PLAIN BEARINGS

Dennis Stanley Baker, High Wycombe, and Glyndwr John Davies, London, both of England, assignors to The Glacier Metal Company, Limited, England

Division of Ser. No. 620,754, Oct. 8, 1975, Pat. No. 4,015,949, which is a continuation of Ser. No. 402,334, Oct. 1, 1973, abandoned. This application Oct. 28, 1976, Ser. No. 736,316

Claims priority, application United Kingdom, Jun. 13, 1973, 28054/73

Int. Cl.² B32B *15/08;* F16C *9/00*

U.S. Cl. 308—237 R **5 Claims**

1. A bearing comprising a steel backing, having an adherent metal powder intermediate layer bonded thereto, and having a layer of polyphenylene sulfide adherent to said intermediate layer by being melt impregnated therein.

4,099,805

EXTRUDABLE LUBRICANT WICKING MATERIAL

Gordon C. Gainer, Penn Hills, and Russell M. Luck, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 16, 1977, Ser. No. 806,970

Int. Cl.² F16C *1/24, 3/14;* C10M *5/00, 7/00*

U.S. Cl. 308—240 **10 Claims**

1. An extrudable, oil-permeated wicking material, comprising a lubricating oil, having a viscosity of between about 100 SUS. and 500 SUS. at 100° F, and a mass of steam-pressure-splayed, lignin-containing, celluosic wood fibers, wherein the fibers retain substantially all of the lignin present initially in the wood, the weight ratio of oil:lignin-containing wood fibers is from about 8:1 to about 3:1 and the oil is contained in microcapillary voids primarily in contact with lignin in the wood fibers so that the lignin in contact with the oil is effective to block oil penetration into the cellulose of the wood.

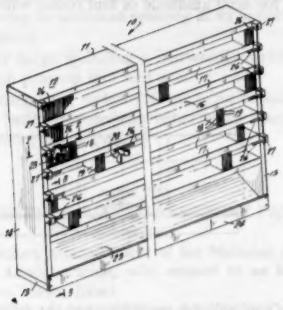
8. A bearing body having a reservoir therein containing the wicking material of claim 1.

4,099,806

COMBINED OPTHALMIC LENS PATTERN RACK AND DISPENSER

Milton B. Savage, 500 Fifth Ave., New York, N.Y. 10036

Filed Apr. 21, 1977, Ser. No. 789,511
Int. Cl.[2] A47F *3/02*
U.S. Cl. 312—117 **1 Claim**



1. A lens pattern rack and dispenser comprising a hollow housing having spaced side walls, a bottom, a top and rear wall, at least one shelf dividing the area within the housing, a plurality of upstanding spaced partitions on the shelf, said shelf and partitions disposed normal to the plane of the rear wall and spaced therefrom, said partitions further dividing the area into a plurality of lens pattern receiving compartments, a chute adjacent the rear wall of the housing in communication with each of the compartments, said chute having an inclined ramp at the bottom thereof and ejecting means comprising a body portion, a depending arm on said body portion and an actuating tab extending from said body portion, said ejecting means further comprising at least one pivotally mounted member swingably carried by the housing laterally slidable upon an elongated rod on the front of the housing and opposite the rear wall to urge lens patterns out of their respective compartments and into the chute, and registerable with at least one of said compartments.

4,099,807

AIRBORNE PULSE MAGNETRON AND POWER SUPPLY SYSTEM

John A. Barnes, Stanton, Calif., assignor to R. Ritter Corporation, Palo Alto, Calif.

Filed Apr. 7, 1977, Ser. No. 785,431
Int. Cl.[2] H02H *3/08, 7/20*
U.S. Cl. 315—127 **7 Claims**

4. A pulse magnetron system including a power supply comprising:

a magnetron;

pulse output transformer means connected to power said magnetron;

a pulse forming network connected to said output transformer;

a capacitor storage circuit;

a pulse transformer interconnecting said capacitor storage circuit and said pulse forming network;

control circuitry for charging and for selectively discharging said capacitor storage circuit;

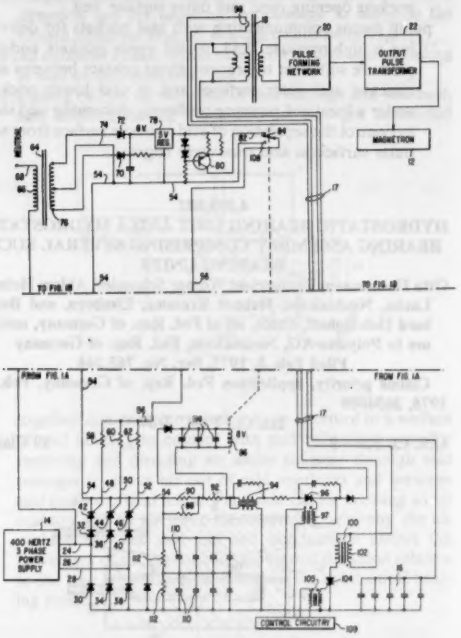
a source of AC power;

rectification means coupled to said AC power source for providing DC charging current for said capacitor storage circuit;

semiconductor means including control electrodes for selectively enabling or disabling said rectification means;

means for deriving a low level DC control voltage from said AC power source;

means for normally applying said control voltage to the control electrodes of said semiconductor means to enable rectification; and



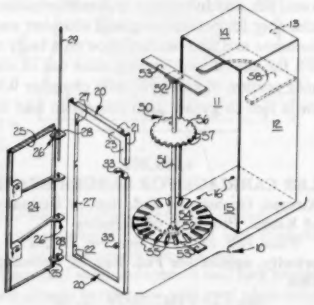
control circuitry responsive to high current fault conditions for charging the control voltage, thereby turning off said semiconductor rectifying means.

4,099,808

UPRIGHT VAULT-LIKE STEEL CABINET FOR GUNS AND VALUABLES

Ervin Carvis Oakley; George Robert Bell, and William Eugene Poole, all of Winston Salem, N.C., assignors to ECO Industries, Inc., Winston Salem, N.C.

Filed Aug. 8, 1977, Ser. No. 822,424
Int. Cl.[2] A47B *49/00;* E05G *1/00;* A47F *3/10*
U.S. Cl. 312—138 R **15 Claims**



1. A security cabinet of steel construction for storage of valuable articles such as guns and the like and comprising an upright generally rectangular enclosure having an open front and wherein all of the walls thereof are of plate steel construction and welded together at their proximal edges along the corners of the enclosure, a rectangular door frame weldably

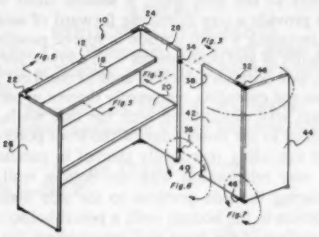
secured to the walls of the enclosure and comprising weldably connected channel members of U-shaped cross-section having a pair of legs and an interconnecting web portion with one of the legs of all of the channel members being weldably connected to the adjacent plate steel wall of the rectangular enclosure, the other legs of the channel members collectively defining a doorway, and the outer faces of the interconnecting web portions of said channel members collectively defining the outer face of the door frame, a plate steel door positioned in said door frame with the outer face of said door being flush with the outer face of said door frame and with the periphery of the door closely conforming with the doorway defined by the door frame, hinge means located interiorly of the enclosure and carried by one of the side channel members of the door frame, said hinge means comprising a plurality of pivotally mounted arms, and extending inwardly of the enclosure a predetermined distance and then outwardly in an arcuate manner with the outer ends of the pivotally mounted arms being weldably secured to inner portions of said door, and a locking bracket weldably secured to the side channel member of the door frame extending along the opposite side of the door from said hinges, said door having an opening therethrough on the side thereof adjacent said locking bracket and said locking bracket having portions extending inwardly from the channel member and other portions extending forwardly through said door opening, and locking means cooperating with the portion of said locking bracket extending through said door opening for securing the door in locked position.

4,099,809

COLLAPSIBLE WORK STATION

Samuel S. Leotta, 303 Harry St., Conshohocken, Pa. 19428

Filed Aug. 13, 1976, Ser. No. 714,259
Int. Cl.[2] A47B *43/00*
U.S. Cl. 312—140.2 **2 Claims**



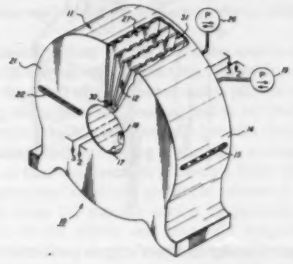
1. A collapsible work station comprising a rear support wall having a front and back surface and a pair of side support walls, means pivotally mounting each of said side support walls to a different side edge of said rear support wall such that said side support walls may be pivoted toward each other and toward said front surface of said rear support wall; a plurality of shelves, the length of each of said shelves being substantially equal to the width of said rear support wall, each of said shelves being pivotally mounted to said front surface of said rear support wall and being movable between a first position wherein said shelves are parallel to said rear wall and a second position wherein said shelves are perpendicular to said rear wall, support means associated with said side support walls for maintaining said shelves in said second position; said means pivotally mounting said side support walls mounting said side walls such that when they are pivoted toward the front surface of said rear support wall and substantially parallel thereto, they are spaced from said front surface of said rear wall a distance at least equal to the thickness of said shelves, whereby said station is collapsed by first pivoting said shelves to their first position wherein they are parallel to the front surface of the rear support wall and thereafter pivoting said side support walls toward said front surface of said rear support wall so that they lie on said shelves.

4,099,810

UPRIGHT DOCUMENT CAROUSEL

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 21, 1976, Ser. No. 688,864
Int. Cl.[2] B65H *39/10*
U.S. Cl. 312—183 **1 Claim**



1. Apparatus for storing documents, comprising:

(a) a housing having a slot on one side and one or more holes on another side, said slot and said one or more holes being aligned;

(b) a carousel having a number of pockets, said carousel being rotatably supported in the housing, the axis of rotation of the carousel having a horizontally disposed directional component;

(c) drive means for rotating the carousel with respect to the housing whereby said pockets may be aligned with the slot and said one or more holes; and

(d) means for providing a fluid stream traversing the slot, a pocket, and said one or more holes;

(e) wherein said carousel includes a circular member and a plurality of spaced plates supported by the member, said plates extending away from the axis of rotation and each of said pockets being defined by at least two different adjacent plates and the member;

(f) wherein said housing includes at least one arcuate groove in the lower half of the housing and each of the plates includes at least one projection at the ends of the plates opposite from the axis of rotation, each projection being movable through one of the grooves when the carousel is rotated to prevent slippage of documents out of said pockets.

4,099,811

BENCH FOR POTTING OF PLANTS AND THE LIKE

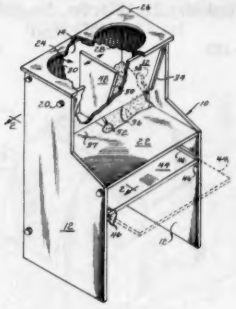
Fentress S. Barry, 2000 Arrow La., Riverwoods, Ill. 60015

Filed May 23, 1977, Ser. No. 799,458
Int. Cl.[2] A47B *81/00*
U.S. Cl. 312—211 **4 Claims**

1. A bench for placing particulate matter into receptacles, such as a potting bench, which comprises:

a frame having side walls and a rear wall, which frame defines a horizontal working surface, a storage bin rearwardly positioned above said working surface, having an openable top and a front wall, said front wall being carried by said side walls in vertically slidable relationship to define a variable sized opening between said front wall and the horizontal working surface to provide access to material in said storage bin, and means for retaining said front wall in a predetermined position to maintain said opening at a desired height, said retaining means comprising a separate polygonal structure defining a plurality of sides of differing length, said polygonal structure being positioned between said horizontal working surface and the bottom of said slidable front wall, said side walls being connected together by rod members under tension to bias

said side walls against the horizontal working surface for strengthening of the bench and said front wall being positioned whereby its lower edge is positioned rearwardly of its upper edge.

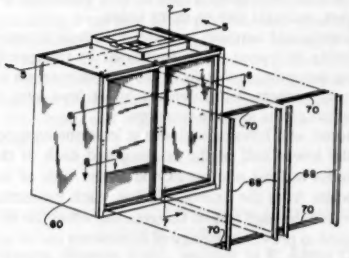


4,099,812

INSULATED CABINET AND METHOD OF CONSTRUCTION

Paul H. Morphy, Prairie Village, Kans., assignor to Hobart Corporation, Troy, Ohio

Division of Ser. No. 711,442, Aug. 4, 1976, Pat. No. 4,040,166.
This application Feb. 18, 1977, Ser. No. 769,928
Int. Cl.² B65D *25/18*; F25D *11/00*
U.S. Cl. 312—214 **8 Claims**



1. An insulated cabinet comprising:

a substantially rigid, metallic, main structural frame,

said main frame being disposed in a substantially vertical plane and constituting a front face of said cabinet,

a plurality of additional metallic components loosely interconnected with each other and said main frame by mechanical connections which in themselves are insuficient to maintain desired positional relationships between said main frame and said additional components.

said main frame and said additional components collectively defining a metal, outer cabinet shell,

said main frame being manufactured to precise dimensional tolerances relative to the tolerances associated with the positional relationships between said additional components and said main frame, said main frame thereby serving as the basic component of said outer shell,

an inner cabinet shell positioned within said outer cabinet shell in spaced relationship thereto and defining therewith an insulating cavity, and

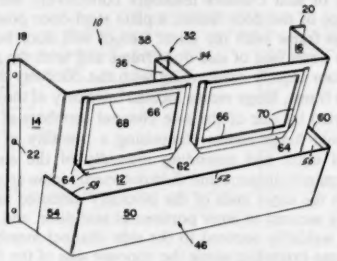
a hardened in situ insulating material substantially filling said insulating cavity and substantially rigidly interconnecting said main frame, said additional components and inner shell and fixing said main frame and said additional components in said desired positional relationships with respect to each other.

4,099,813

TRUCK CAB CADDY

Andre J. Olivan, 1973 Dora Ave., Walnut Creek, Calif. 94596

Filed Mar. 31, 1976, Ser. No. 672,085
Int. Cl.² A47F *7/00*
U.S. Cl. 312—243 **2 Claims**



1. A cab caddy for holding documents and the like comprising a first sheet of material formed to provide a compartment in cooperation with a surface it is mounted on, including front wall, trapezoidal side walls joined to each end of the front wall by right angle bends in said material rearward of the front wall, flanges provided at rear edges of side walls by bend means in the material, a bottom member joined to the bottom edge of the front wall by bend means and extending rearwardly thereof to a plane defined by said flanges, a lip joined to the rearward edge of the bottom member by bend means and extending upward therefrom coplanar with the flanges, tab members joined to side edges of the bottom member by bend means and extending upward therefrom parallel with and interiorly adjacent the trapezoidal side walls, fastening means securing the tab members to the side walls, a second sheet of material formed to provide a tray extending forward of said compartment and including a front portion in spaced parallel relationship forwardly of and coterminous with a lower portion of the front wall, side portions joined to ends of the front portion by bend means and extending rearwardly thereof in parallel overlapping part way relationship with the side walls, a bottom portion joined to the lower edge of the front portion by bend means and extending rearwardly thereof in parallel overlapping part way relationship with the bottom wall, fastening means securing the side portions to the side walls, and the bottom portion to the bottom wall, a pencil holder secured to the inner surface of the front wall intermediate the side walls and extending rearwardly thereof whereby the compartment will be divided by said pencil holder into respective chambers, said pencil holder comprising a third sheet of material formed to include spaced parallel walls extending rearwardly of the front wall parallel with the side walls, a transverse rear wall joined to the rearward edges of the side walls by bend means, flanges parallel to and abutting the front wall joined to the front edges of the parallel walls by bend means, bottom tab joined to the bottom of one of said parallel walls by bend means and extending normal thereto to said other parallel wall, fastening means securing the flanges to the front wall, at least one document frame, secured to said front wall, said document frame comprising side and bottom flange means secured to said front wall, border means defined by rectangular openings, and stepped portions joining said border means with said flanges.

4,099,814

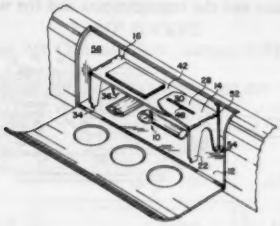
GLOVE COMPARTMENT SHELF

John Hasselberger, Box 846, East Hampton, N.Y. 11937

Filed Jan. 10, 1977, Ser. No. 757,922
Int. Cl.² A47B *96/02*; B60R *7/06*
U.S. Cl. 312—317 R **3 Claims**

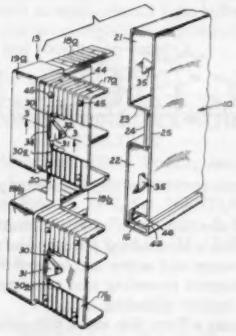
1. A shelf positioned in a glove compartment of an automobile, comprising:

a first and second shelf component,
each of said shelf components including a substantially horizontal and a substantially vertical portion, said vertical portion of each of said shelf components including
a substantially U-shaped end portion pivotally connected to one end of said horizontal shelf portion,
said U-shaped end portion including a pair of legs for supporting said horizontal shelf portion, and a hinge connecting the bight portion of said support to said horizontal shelf; means for adjustable connecting the horizontal portions of said shelf components including



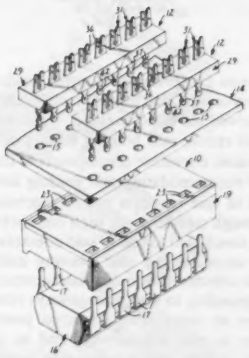
an elongated slot in the horizontal portion of one of said shelf components adapted to be overlapped with a relatively transverse slot in the horizontal portion of the other of said shelf components;
an elongated threaded shank received through said overlapping slots in said horizontal shelf portions, and
a nut threadedly received on the end of said shank,
so that one of said shelf components may be adjusted axially, laterally, and angularly with respect to the other.

4,099,815
STRUCTURAL ELEMENTS
Terence Allan Cox, Polesworth, and David Roger Lewis, Belgrave, both of England, assignors to Swish Products Limited, England
Filed May 20, 1976, Ser. No. 688,184
Claims priority, application United Kingdom, May 30, 1975, 23572/75
Int. Cl.[2] A47B *47/00*
U.S. Cl. 312—330 R **4 Claims**



1. A set of elements for forming the side walls of a tray-like structure, said elements including a wall member defining a mortice socket opening to one end of said member and a connecting member having a body portion and at least one tenon formation having a free end insertable into the mortice socket to locate the body portion in predetermined alignment with the wall member to form the structure, the tenon formation being provided with a laterally projecting retaining detent for engagement in a mating aperture in a sidewall of the mortice socket to resist withdrawal of the tenon formation therefrom; wherein the improvement comprises:
(a) means providing a central region of the tenon formation with a single, generally U-shaped slot defining a resilient tongue carrying said retaining detent at its free, resilient end, said free end of the tongue being directed away from the free end of the formation and being entirely bordered by the remainder of said tenon formation, said tenon formation free end constituting a one-piece, uninterrupted member;
(b) said retaining detent having a leading end facing in the direction of the free end of the tenon formation and away from the free end of the tonque and a pair of edge faces diverging away from said leading end to an abutment part of the detent which is substantially broader than said end,
(c) said mating aperture being a through aperture in said sidewall so that the detent is accessible from the exterior of the completed structure to enable release of the tenon formation from the mortice socket by pressing the abutment part of the detent and thus said tongue free end inward of the aperture to flex the resilient tongue, and
(d) said detent having an acute angle leading tip and an abutment part in the form of a transverse face which merges with the free end of the tongue.

4,099,816
ELECTRICAL CONNECTOR SYSTEM
John E. Bittner, Inver Grove Heights, and Robert S. Dodsworth, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 689,976, May 26, 1976, abandoned.
This application Jun. 3, 1977, Ser. No. 803,206
Int. Cl.[2] H05K *1/12*
U.S. Cl. 339—17 CF **6 Claims**



1. An electrical connector system for use with a perforated circuit board, comprising:
a connector body comprising:
an insulating housing having a plurality of apertures therethrough, the aperture openings at one face of said housing being spaced to align with perforations in a said circuit board, and
a plurality of spring contact elements retained in said housing, one within each aperture therethrough, each said spring contact element being formed of a metal strip and having two adjacent oppositely directed pairs of resilient jaws for slidably receiving and releasably contacting oppositely extending flat plate conductors, one pair of jaws being aligned with an opening at said one face of said housing and the oppositely directed pair of jaws being aligned with the aperture's opening at the opposite face of said housing; and
a contact strip comprising:
an insulating contact retainer having a plurality of contact

apertures therethrough, the aperture openings at one face of said contact strip being spaced to align with perforations in a said circuit board and said openings at said one face of said connector body housing, and

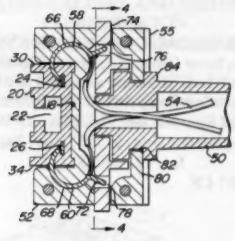
a plurality of spring compression reserve wire contact elements, one in each of said contact apertures, each said spring compression reserve wire contact element having a spring compression reserve wire contact slot accessible at the face of said contact retainer opposite said one face thereof and having a tail extending from said one face of said contact retainer to fit through a perforation in a said circuit board and an aligned aperture in said one face of said connector body housing into the aligned resilient jaws of a spring contact element.

4,099,817

TRACK LIGHTING

Donald J. Booty, 513 Durham Dr., Frankfort, Ill. 60423, assignor to Donald J. Booty and Marvin Feig, both of Chicago, Ill.

Filed Jan. 27, 1977, Ser. No. 763,184
Int. Cl.[2] H01R *7/06, 13/54*
U.S. Cl. 339—22 B **13 Claims**



1. Apparatus comprising a housing having a generally U-shaped recess on one side for embracing outer faces of a track, a pair of curved movable contacts supported by the housing adjacent said recess, said housing having curved discrete passageways whose curvature corresponds to that of said contacts for slidably accommodating and guiding said contacts on opposite sides of said recess, a pair of electrical conductors extending through said housing, each conductor having one end electrically connected to one of said contacts, a movable actuator means supported by said housing and coupled to said contacts for selectively moving said contacts along a curved path corresponding to said passageways relative to said housing between an inoperative retracted position wherein said contacts are in said passageways and an operative position wherein the contacts extend into said recess, the free end of each contact being adapted to engage a conductor bus on a track only when the contacts are in their operative position.

4,099,818

NON-EXPLOSIVE INITIATOR

Willy L. Meinzer, Canoga Park, Calif., assignor to Viking Industries, Inc., Chatsworth, Calif.

Filed May 9, 1977, Ser. No. 795,099
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—45 R **22 Claims**

1. In combination for providing a movement of a first output member relative to a second output member,

a sleeve,

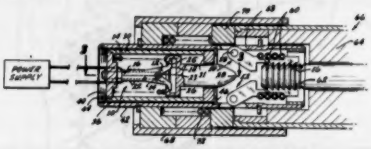
a wire having properties of disintegrating upon the application of an electrical current,

means operatively coupled to the wire for applying an electrical current to the wire to disintegrate the wire,

first means disposed within the sleeve and cooperative with the wire in a first position for restraint by the wire against movement to a second position and biased for movement to the second position upon release by the wire,

second means disposed within the sleeve and biased against movement by the first means in the first position and disposed relative to the first means for movement in a particular direction upon the movement of the first means to the second position,

third means disposed within the sleeve relative to the first means and the second means for providing for the insertion of the first means and the second means and the wire into the sleeve with the wire biasing the first means to the first position and for providing for the withdrawal of the first means and the second means and the wire from the sleeve,



fourth means disposed within the sleeve and restrained against movement during the biasing of the second means against movement in the particular direction and released for movement by the second means in accordance with the movement of the second means in the particular direction, and

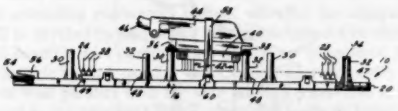
fifth means disposed within the sleeve and cooperative with the fourth means and biased for movement in the particular direction, upon the release of the fourth means for movement, and disposed in cooperative relationship with the first output member to obtain a movement of the first output member in the particular direction relative to the second output member.

4,099,819

MODULAR TERMINATION SYSTEM FOR TELECOMMUNICATION DEVICES

Josef Keglewitsch, Addison, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sep. 13, 1976, Ser. No. 722,675
Int. Cl.[2] H01R *11/20, 13/54*
U.S. Cl. 339—75 M **31 Claims**



1. Modular interconnection apparatus comprising: connector

a plurality of contacts, each of said contacts including an active portion, a terminating portion, and an intermediate portion between said active and termination portions;

a one-piece support mounting said plurality of contacts in rows, said support including

a panel having a front side and a rear side,

a plurality of first projections extending from said rear side, said projections arranged in said rows,

a plurality of contact passageways each extending through a respective first projection and through said panel, each of said passageways receiving and mounting a respective contact with said intermediate portion in said first projection and said termination portion extending rearwardly of said first projection, and

a plurality of second projections extending from said rear side; and

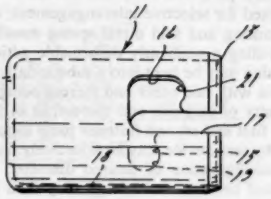
a plurality of mating electrical connector units mounted on said second projections, each of said connector units including a plurality of contacts each having a termination portion and a mating portion, said mating portions adapted for engaging contacts of a complementary mating electrical connector unit, said termination portions of said contacts of a row of contacts electrically connected to respective termination portions of said contacts of a respective mating electrical connctor unit thereby associating each row of contacts with a separate electrical connector unit.

4,099,820

LAMP SOCKET

Don L. DeLano, Mt. Clemens, Mich., assignor to Microdot Inc., Greenwich, Conn.

Filed Jun. 1, 1977, Ser. No. 802,457
Int. Cl.[2] H01R *33/46*
U.S. Cl. 339—88 R **1 Claim**



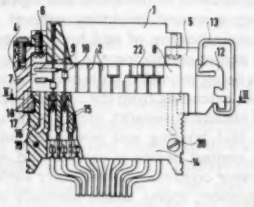
1. A socket capable of accepting conventional single or multicontact light bulbs having radially aligned or axially offset retention pins in the base thereof, respectively, said socket comprising a cylindrical sleeve having a radially inwardly extending flange at one end thereof, first and second diametrically related J-slots in said sleeve defined by axial slots and circumferentially offset open spaces with pin seats at the ends thereof remote from the flange on said sleeve, the pin seat in said first J-slot and closest to said flange being in radial alignment with an enlarged open space defined by the offset portion in said second J-slot, the pin seat in the offset portion of said second J-slot being axially spaced a distance from the pin seat in said first J-slot exactly equal to the spacing of the axially offset pins of a conventional multi-contact light bulb whereby single contact light bulbs having axially aligned retention pins as well as multi-contact light bulbs having axially offset retention pins are acceptable and positively supported by the pin seats in said socket.

4,099,821

ELECTRIC CONNECTION BLOCK WITH MULTIPLE CIRCUITS

Jean Debaigt, Maisons Laffitte, France, assignor to CGEE Alsthom S.A., Levallois-Perret, France

Filed Feb. 24, 1977, Ser. No. 771,488
Claims priority, application France, Mar. 3, 1976, 76 06009
Int. Cl.[2] H01R *9/14, 13/54, 13/58*
U.S. Cl. 339—91 R **3 Claims**



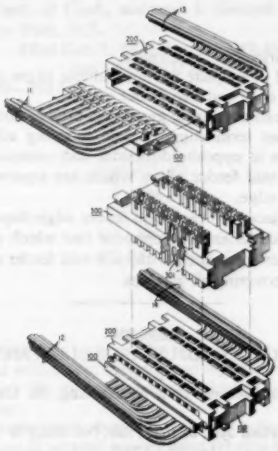
1. An electric connection block having multiple circuits, said block comprising: a base carrying multiple rows of contact pins which are parallel to one another and have free ends projecting outwardly from one side of the base, said base carrying at both ends and to said one side guide bars of insulating material, said guide bars being parallel to the contact pins and perpendicular to the rows and being spaced laterally from the contact pins at respective ends of said rows, a plurality of plugs in side abutting contact and spanning between said guide bars for carrying conductors to be electrically connected to the projecting ends of said contact pins, each plug receiving contact pins of a given row, said guide bars bein slotted in a comb configuration and forming spaced portions faing away from said base, and means for interfitting the ends of said plugs respectively to the ends of respective guide bar portions remote from said base with said base, said guide bars and said plugs defining wiring channels at the ends of the rows of contact pins, to permit conductors to extend through said guide bar slots and wherein said plugs are spaced sufficiently from said base to provide an extended free length to the contact pins to allow conductors connections to respective contacts pins of said rows with said plugs being individually supported by opposed aligned portions of said guide bars as defined by said comb slots.

4,099,822

CONNECTOR FOR MAKING SPLICING, HALF-TAP, BRIDGING AND TERMINATING CONNECTIONS OF MULTIPLE INSULATED CONDUCTORS

Arthur Wallace Carlisle, and Dean Rudisill Frey, both of Dunwoody, Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 24, 1977, Ser. No. 761,978
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—98 **12 Claims**



1. A connector for electrically joining at least two wires, comprising in combination:

a wire mandrel comprising:

first and second wire-receiving surfaces; and

one or more wire guide channels common to each said surface for positioning a given wire along both of said surfaces, said wire guide channels including wire insulation gripping teeth for holding said wire adjacent to both of said surfaces;

a unitary mandrel holder comprising:

a first and a second face defining therebetween an open-ended interior chamber for receiving said mandrel;

each said face having an access hole, with two such holes being aligned on opposite sides of each one of said wire

guide channels when said mandrel is inserted into said chamber; and

a contact module comprising:

one or more contact-receiving cavities each positioned to align with an access hole pair; and

a contact element having two like ends and contained in each of said cavities for engaging two different positioned wires carried on oppositely disposed first wire-receiving surfaces of two different wire mandrels to effect the connection therebetween.

4,099,823

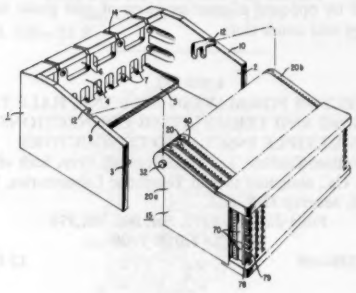
HIGH DENSITY MULTIPAIR CABLE CONNECTING BLOCK

Alfonso Joseph D'Alessio, Rockaway, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 18, 1977, Ser. No. 779,258

Int. Cl.[2] H01R *3/00*

U.S. Cl. 339—113 B **15 Claims**



1. A wire organizer comprising:

a two-sided index plate having multiple edges including an indexing edge and two feeder edges;

a set of spaced concentric grooves in each of said sides, each groove set terminating at said indexing edge, leading therefrom in opposite directions and culminating on respective said feeder edges which are separated by said indexing edge;

a recess adjacent to each said feeder edge disposed on the side of said index plate opposite that which contains the groove set connecting with each said feeder edge; and

means for covering all grooves.

4,099,824

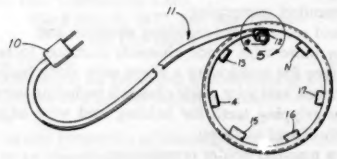
MECHANICALLY ADJUSTABLE ELECTRIC OUTLET DEVICE

Victor H. Schoppelrey, 1202 N. Harding, St. Orange, Calif. 92667

Filed Jun. 3, 1977, Ser. No. 802,970

Int. Cl.[2] F21P *1/02*

U.S. Cl. 339—157 C **1 Claim**



1. A multiple electrical outled device which is mechanically adjustable, comprising:

an elongated housing made of insulating material;

a pair of electric circuit wires disposed in spaced relation within said housing;

a plurality of contact pairs spaced along the length of said housing, the contacts in each of said pairs extending into the interior of said housing and being connected to corresponding ones of said circuit wires, said housing having openings through which said contacts are accessible from the exterior of said housing, whereby each of said circuit pairs provides a separate electrical receptacle;

an elongated metal spring member disposed within said housing and insulated from said circuit wires, said spring member extending substantially the full distance between the two most remote ones of said receptacles;

means associated with one end of said housing for selectively energizing said circuit wires;

a first fastener part carried by the other end of said housing;

at least two of said receptacles adjacent said one end of said housing being of such configuration as to form a second fastener part, said first and second fastener parts being adapted for selective interengagement; and

said housing and said metal spring member cooperatively providing a resiliently deformable action such that said housing may be bent into a substantially circular configuration with said other end thereof being positioned in the vicinity of said one end thereof, in order to interengage said first and second fastener parts together;

whereby said device may be selectively formed into a circular configuration of desired diameter, and when usage thereof has been completed, may then be returned to its original essentially straight configuration.

4,099,825

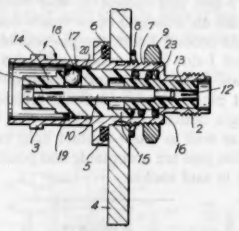
COAXIAL ADAPTER

Samuel H. Jackson, Ardsley, N.Y., assignor to Kings Electronics Co., Inc., Tuckahoe, N.Y.

Filed Aug. 24, 1977, Ser. No. 827,217

Int. Cl.[2] H01R *17/06, 33/30*

U.S. Cl. 339—177 E **4 Claims**



1. In an adapter plug for joining two different coaxial plugs, which comprises a generally cylindrical metal housing and provided with external means at each end for mechanically attaching said coaxial plugs to said adapter, and a center conductor having means at each end for receiving the center conductor of said coaxial plugs, the improvement which comprises a first insulating support for said center conductor, surrounding one end of the same, and rigidly mounted within said housing, a second insulating support slidably mounted within the main portion of said housing and about the other end of said center conductor, the body of said second insulating support being provided with one or more radial openings near one end, extending from the center conductor to the outer face of said insulating support, means forming a metallic shoulder within said housing and positioned adjacent said radial openings, a contact device in each of said openings extending from the center conductor to the outer surface of said second insulating support, spring means normally urging said second insulating support in a direction to press said contacting devices into engagement with said shoulder, an insulating sleeve

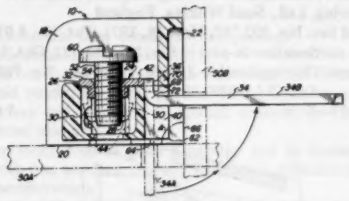
positioned within said housing adjacent said shoulder and covering a portion of said openings when the contacting devices and the shoulder are in contact-making position, whereby movement of said second insulating support against said spring resulting from the mechanical connection of one of the coaxial plugs shifts said contacting means away from said shoulder and under the internal surface of said insulating sleeve.

4,099,826

FEED-THROUGH TERMINAL BLOCK

Charles F. Mazzeo, Scotch Plains, and William T. Waddington, Fanwood, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Apr. 7, 1977, Ser. No. 785,531
Int. Cl.[2] H01R *9/10*
U.S. Cl. 339—198 R **8 Claims**



1. A dual orientation feed-through terminal block for detachably connecting external electrically conductive elements to further circuitry, said terminal block comprising:

a block of dielectric material having opposite sides, a first base extending between the sides, and a second base extending between the sides and making an angle with the first base;

at least one recess in the block;

a slot in the block, said slot having a continuous opening facing both of the first and second bases and communicating with the recess; and

an electrical terminal member affixed to the block within the recess, the terminal member having a terminal portion for selectively connecting and disconnecting an external conductive element and the terminal member, said terminal portion including a platform having an upper surface, and said terminal member further having an integral electrical contact extending through the slot and projecting beyond one of said bases;

said contact being movable into one of first and second positions, while the terminal member remains affixed to the block, the contact in the first position thereof projecting beyond the first base and the contact in the second position thereof projecting beyond the second base, whereby the block may be mounted upon either selected one of the first and second bases and provide a feed-through beyond said selected one of the bases;

the opening of the slot including a first open portion parallel to the first base and a second open portion parallel to the second base, the first and second open portions being in open communication with one another such that the contact is movable laterally from one open portion into the other when moved from one of the first and second positions to the other; and wherein

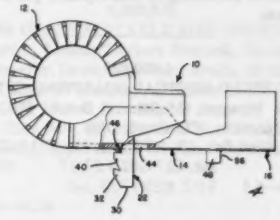
the opening of the slot is spaced from the upper surface of the platform in a direction extending downwardly from the upper surface such that the conductive element, when clamped to the upper surface of the platform, will be blocked from entering the slot by the material of the block.

4,099,827

LATCHING DEVICE

Van Keith Webster, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 15, 1977, Ser. No. 816,042
Int. Cl.[2] H01R *11/02*
U.S. Cl. 339—228 **14 Claims**



1. A latching device for a battery terminal of the type having a channel with an opening therethrough and a post-engaging hoop at one end, which comprises:

a. an elongated finger attached to the free end of the hoop and adapted to be inserted into the opening in the channel;

b. a plurality of teeth on the free end of the finger, said teeth being adapted to be latched against the wall of the opening to retain the finger therein; and

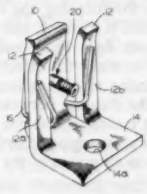
c. means on the finger for inserting it into the opening.

4,099,828

BLADE-TYPE FUSE CLIP WITH FIELD INSTALLABLE REJECTION MEANS

Louis T. Stegmaier, Plainville, and Howard Reynolds, New Britain, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 7, 1977, Ser. No. 840,456
Int. Cl.[2] H01H *85/24*
U.S. Cl. 339—258 F **8 Claims**



1. A rejector fuse terminal clip for accepting a fuse terminal blade keyed with a special notch and rejecting a fuse terminal blade lacking the special notch, said fuse clip comprising, in combination:

A. first and second clamping arms upstanding from a common base in parallel, spaced apart relation to define therebetween a fuse terminal blade receiving slot;

B. means forming a hole in said first clamping arm and an interruption in said second clamping arm in opposed relation across said slot from said hole; and

C. interference means cantilever mounted by said first clamping arm for extension across said slot and through said interruption in said second clamping arm to reject insertion into said slot of a fuse terminal blade lacking the special notch, said interference means including

(1) a rejector pin having an enlarged head and a shank of a diameter conforming to the diameter of said hole,

(2) means forming an annular groove in said shank adjacent the free end thereof remote from said head,

(3) a helical compression spring carried on said shank intermediate said head and said groove, and

(4) a spring clip lodged in said groove and having a diameter exceeding the diameter of said hole,

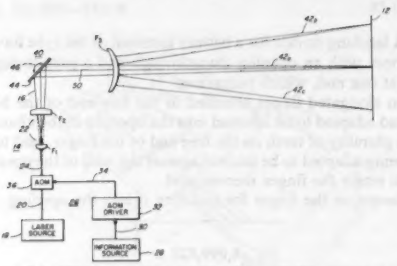
(5) said shank extending through said hole to dispose said groove on the opposite side of said first clamping arm from said slot, said spring clip, as lodged in said groove, preventing removal of said rejector pin from said hole, and said compression spring being compressed between said head and said first clamping arm to rigidify the cantilever mounting of said rejector pin to said clamping arm.

4,099,829

FLAT FIELD OPTICAL SCANNING SYSTEM

Ronald Jack Straayer, Melbourne Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Feb. 23, 1977, Ser. No. 771,068
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.1 **13 Claims**



1. An optical system for scanning a light beam on a flat field surface comprising:

a. means supplying a diverging laser light beam,

b. means disposed in the path of the diverging light beam for scanning the light beam on the flat surface,

c. a converging lens disposed between the flat field surface and the scanning means and in the path of the diverging laser light beam for focusing the beam at the flat field surface as the beam is scanned, and

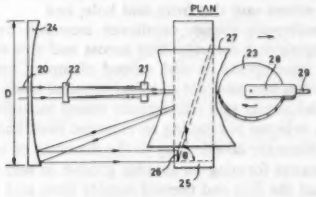
d. the diverging laser light beam and the scanning means being positioned to make the effective laser beam source appear to be moving along a spherical surface having a radius equal to the distance between the beam supplying and the scanning means so that due to the petzval curvature effect of the converging lens the laser light beam is focused equally on all points of the flat field surface.

4,099,830

OPTICAL SYSTEMS INCLUDING POLYGONAL MIRRORS ROTATABLE ABOUT TWO AXES

Harry Reed Whittle, Wallingford, and Brooke Armitage Ward, Goring, both of England, assignors to A. J. Bingley Limited, Bristol, England

Filed Dec. 15, 1976, Ser. No. 750,721
Int. Cl.[2] G02B *27/17;* B23K *9/00*
U.S. Cl. 350—6.8 **6 Claims**



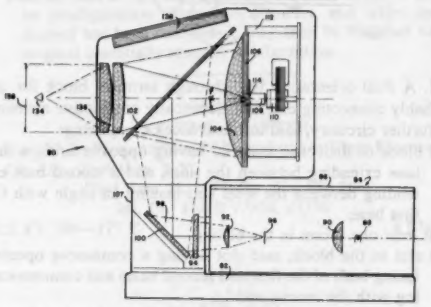
1. An optical system for scanning a beam of radiant energy across a moving workpiece to be acted upon by the radiant energy, said system comprising a cylindrical mirror arranged to bring the beam of radiation to an initial line focus, a polygonal mirror mounted for rotation about an axis, the orientation of which relative to the longitudinal axis of the cylindrical mirror can be varied, and arranged to scan the beam of radiation across a spherical mirror which is positioned to reform the image of the line focus of the beam of radiation on the workpiece, and means for varying the orientation of the axis of the polygonal mirror as a function of the rate of scan of the beam of radiation across the workpiece and the velocity of the workpiece so that the line-focused image is perpendicular to the direction of motion of the workpiece and traverses the workpiece in a straight line in the direction of the line focus.

4,099,831

HIGH MAGNIFICATION OPTICAL APPARATUS WITH ROTATABLE REFLECTIVE LENTICULATED SURFACE

Robin John Freeman, Send Woking, England, assignor to Vision Engineering, Ltd., Send Woking, England

Division of Ser. No. 202,743, Nov. 29, 1971, Pat. No. 4,012,109, which is a continuation-in-part of Ser. No. 863,952, Oct. 6, 1969, abandoned. This application Jul. 26, 1976, Ser. No. 708,617
Int. Cl.[2] G02B *21/38;* G03B *21/60*
U.S. Cl. 350—9 **5 Claims**



1. Apparatus producing an enlarged exit pupil, comprising:

a. means for positioning at said apparatus an object to be viewed;

b. objective lens means spaced from said object;

c. projection lens means spaced from said objective lens means in the optical path proceeding from said objective lens means;

d. first field lens means positioned in said optical path beyond said projection lens means;

e. a rotatable disc carrying a reflective lenticulated surface over which discrete lenticules are distributed positioned in said optical path beyond said first field lens means at focal plane of the image so that each lenticule reflects light incident thereon back through said first field lens means;

f. second field lens means positioned in the continuing optical path reflected from said lenticulated surface;

g. reflecting means on the side of said second field lens means opposite said lenticulated surface and oriented to reflect the light incident thereon to the eye of an observer, and

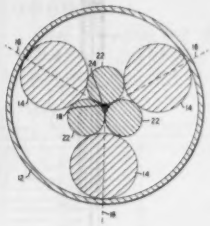
h. means to rotate said discs to provide uniform motion of said lenticulated surface in a direction to cause the depressions of said lenticules to scan across light pencils incident thereon at a speed such that the persistence of vision and form of said depressions of said lenticules effectively multiplies the angle of light egress from said surface of said light pencils whereby effectively to produce said enlarged exit pupil at the eye of said observer.

4,099,832

OPTICAL FIBER CONNECTOR UTILIZING NESTED ROD ARRANGEMENT

Arthur Woodward Warner, Jr., Whippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1976, Ser. No. 754,603
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 12 Claims



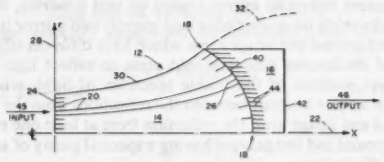
1. An optical fiber connector comprising:
a cylindrical resilient sleeve,
three outer rods affixed to the inner surface of said sleeve, said outer rods being parallel to the cylinder axis of said sleeve and disposed in spaced relation to one another about said axis,
three inner rods extending parallel and in mutual contact with one another, thereby forming a cylindrical aperture therebetween,
an optical fiber disposed within said aperture and secured to said inner rods,
the diameter of said outer rods being larger than the diameter of said inner rods so that, when said inner rods are inserted between said outer rods, each of said outer rods contacts a pair of adjacent inner rods along their length and a net compressive force is supplied to said inner rods.

4,099,833

NON-UNIFORM FIBER OPTIC IMAGING SYSTEM

Christopher H. Tosswill, Sturbridge, Mass., assignor to Galileo Electro-Optics Corp., Sturbridge, Mass.

Continuation of Ser. No. 449,520, Mar. 8, 1974, abandoned. This application Jul. 19, 1976, Ser. No. 706,457
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.25 6 Claims



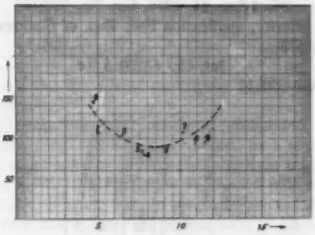
1. A non-uniformly image-modifying optical device comprising
a first bundle of optical fibers of varying length,
a second bundle of optical fibers of varying length,
a first imaging surface on said first bundle,
a second imaging surface on said second bundle,
each said imaging surface being in fiber-optically transmissive relation with each said bundle and spaced by at least one bundle from an interface between bundles, and said first bundle being joined with said second bundle at a curved interface therebetween,
each said bundle having a tapering portion made up of optical fibers of diameter increasing with increase in bundle diameter in said tapering portion,
said interface intercepting said tapering portion at varying distances along the length of said tapering portion, said distances being chosen so that said interface intercepts optical fibers of said tapering portion at varying cross-sectional areas thereof,
whereby an image introduced onto one said imaging surface is made to appear, non-uniformly modified, on the other said imaging surface.

4,099,834

LOW LOSS GLASS SUITABLE FOR OPTICAL FIBER

Marga Faulstich, Mainz; Norbert Neuroth, Mainz-Mombach; Franz Reitmayer, Drais, and Georg Krolla, Mainz-Mombach, all of Fed. Rep. of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Nov. 25, 1974, Ser. No. 527,152
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1973, 2359657
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.34 21 Claims



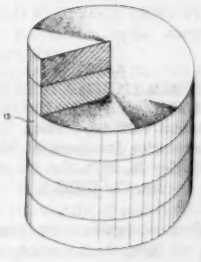
1. An optical fiber having an optical loss of not more than 150 dB/km, high transparency, and a high flexural strength, said optical fiber comprising a sheath and core, at least one of said sheath and core being a glass of a composition consisting essentially of:
SiO_2: 65–75 mol-% (38–46% by weight);
R_2O: 4–17 mol-% (4–13% by weight);
PbO: 16–25 mol-% (42–55% by weight);
wherein R_2O is Na_2O, K_2O or Cs_2O or mixtures thereof and with the provision that the molar ratio of SiO_2 : PbO is 2.5–4.0.

4,099,835

OPTICAL FIBERS WITH HELICAL GRADATIONS IN COMPOSITION

William George French, Plainfield, and John Burnette MacChesney, Lebanon, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 640,577, Dec. 15, 1975, Pat. No. 4,017,288. This application Oct. 8, 1976, Ser. No. 730,803
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.30 3 Claims



1. An optical fiber with a transmitting core comprising a first

helical region intertwined about at least one other second helical region, the index of refraction values of the first helical region being different than the index of refraction values of the second helical region along substantially the entire boundary between the two helical regions, the length of the longitudinal gradation in the resulting fiber being between one and ten millimeters.

4,099,836

OPTICAL CONTROL DEVICE FOR INTEGRATED OPTICAL CIRCUIT

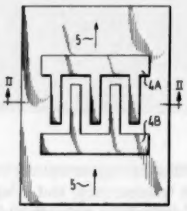
Peter Baues, Krailling, and Rolf Pläettner, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 14, 1976, Ser. No. 723,146

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1975, 2541673

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.14 **14 Claims**



1. An improved optical control device for an integrated optical circuit, said control device incorporating a substrate and a wave guide layer associated with one face thereof, said substrate and said wave guide layer each being comprised of monocrystalline material selected from the group consisting of strontium titanate and barium titanate, and mixed compositions of strontium titanate and barium titanate, provided that, when said substrate comprises monocrystalline strontium titanate, said wave guide layer is comprised of a monocrystal selected from the group consisting of barium titanate and mixed compositions of barium titanate and strontium titanate, and, when said substrate comprises a monocrystal selected from the group consisting of barium titanate and mixed compositions of barium titanate and strontium titanate, said wave guide layer comprises monocrystalline strontium titanate.

4,099,837

COATING OF FIBER LIGHTGUIDES WITH UV CURED POLYMERIZATION PRODUCTS

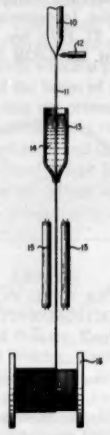
Hargovind Nihchaldas Vazirani, Stirling, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 26, 1976, Ser. No. 690,158

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.29 **4 Claims**

1. An optical fiber waveguide comprising a glass fiber and a polymer coating the fiber, the invention characterized in that the polymer coating comprises the polymerization product of a prepolymer mixture resulting from reacting acrylic acid with a 0.4 to 1.0 weight ratio mixture of aliphatic diglycidyl ether to aromatic diglycidyl ether, and further characterized in that the



polymerization product contains a UV sensitizer in order to cure said prepolymer mixture with ultra violet light.

4,099,838

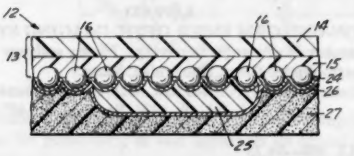
REFLECTIVE SHEET MATERIAL

Jack E. Cook, Saint Paul, and Terry R. Bailey, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 7, 1976, Ser. No. 693,299

Int. Cl.² G02B 5/28

U.S. Cl. 350—105 **27 Claims**



1. Sheet material comprising a transparent base substrate, a transparent dielectric mirror coated on said substrate, and an optically thick layer overlying said mirror; said mirror including background and image areas which have different effective optical thicknesses that tune said areas to reflect light from different portions of the visible spectrum of light, whereby there is a color contrast between the reflections from the background and image area; the reflection from at least one of said background and image areas having a spectral purity of at least about 40 percent.

4,099,839

FASTER ADDRESSING OF ELECTROCHROMIC DISPLAYS

Robert Domenico Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 597,111, Jul. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 409,830, Oct. 26, 1973, abandoned. This application Sep. 23, 1976, Ser. No. 726,026

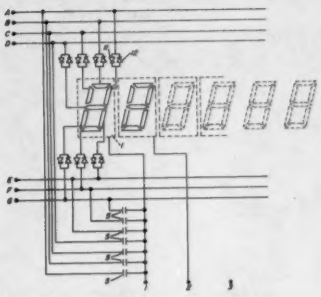
Int. Cl.² G02F 1/36

U.S. Cl. 350—357 **3 Claims**

1. In an electro-optical display device which contains a plurality of elements, each of said elements comprising a light transmitting substrate with a persistent electrochromic mate-

rial as a light modulating material, a counter-electrode, and an ion conductive material in contact with said electrochromic material and said counter-electrode, an improved method to sequentially address each element comprising:

1. providing means for a pulse of direct current, and



2. one capacitor per element with said capacitor being in parallel connection with said element and the counter-electrode to transfer said pulse to the element for a fixed limited time interval, wherein the transfer interval is sufficiently long so as to accomplish writing or erasing of said element and the transfer interval occurs independently of the addressing.

4,099,840

MULTILAYER REFLECTOR FOR GAS DISCHARGE LASER

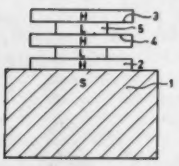
Johannes van der Wal; Wilhelmus Adrianus Jacobus Gielens, and Johannes Maria Marinus Pasmans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,175

Claims priority, application Netherlands, Oct. 2, 1975, 7511581

Int. Cl.² G02B *5/28*

U.S. Cl. 350—166 **6 Claims**



1. A reflector comprising a substrate bearing a system of oxide layers alternately having high and low refractive indices, wherein at least the last layer in the system which is most remote from the substrate having a high refractive index consists of a mixture of at least one of the oxides of thorium, titanium, zirconium or hafnium and at least one of the oxides of beryllium, magnesium or calcium.

4,099,841

HEAD UP DISPLAYS USING OPTICAL COMBINER WITH THREE OR MORE PARTIALLY REFLECTIVE FILMS

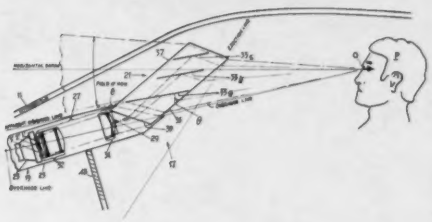
Stafford Malcolm Ellis, Maidstone, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Jun. 20, 1977, Ser. No. 807,920

Claims priority, application United Kingdom, Jun. 30, 1976, 27169/76; Feb. 3, 1977, 4477/77

Int. Cl.² G02B *27/14*

U.S. Cl. 350—173 **12 Claims**



1. A display unit for a head up display system for use in a vehicle comprising:

an optical projector which projects, collimated, from an output aperture, optical data presented by a source; and

an optical combiner comprising partially light transmissive, partially light reflective means so located with respect to said output aperture that, in use, an observer viewing a distant real world scene by transmission of light through said means sees optical data projected through the output aperture, after reflection at said means, as a virtual image superimposed on the distant scene

and including the improvement that the output aperture of the optical projector is of generally rectangular shape and said optical combiner comprises: a body of light-transmissive, refractive material having first and second substantially optically flat parallel external surfaces which face respectively, forwardly, towards the distant real world scene and rearwardly, towards the observer, in use of the unit; within said body, at least three substantially optically flat and parallel films supported and separated by the material of the body and effective to reflect light incident thereon from the optical projector and to transmit light incident thereon from the real world; and a third external surface through which optical data from said projector enters said body for subsequent reflection at said films towards the observer, said third external surface making with said films an angle equal to the angle between the films and said second surface, and said films being relatively positioned so that, observed in the observer's viewing direction to the distant scene, each said film provides a different field of view of the projected optical data.

4,099,842

WIDE FIELD EYEPIECE LENS SYSTEM

Masanobu Kaneko, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,474

Claims priority, application Japan, Dec. 12, 1975, 50-147385

Int. Cl.² G02B *9/30, 9/34*

U.S. Cl. 350—175 E **2 Claims**

1. An eyepiece lens system having an apparent field of view more than 60° and an eye relief greater than 80% of the total focal length of itself, comprising a first lens group, a second lens group disposed rearwardly of said first lens group and a third lens group disposed rearwardly of said second lens group, said first lens group including a positive meniscus lens component with its convex surface facing rearward, said second lens group including a cemented positive doublet lens

component consisting of a biconvex lens element and a negative meniscus lens element, said third lens group including at least a positive meniscus lens component with its convex surface facing forward, said eyepiece lens system satisfying the following conditions:

$$-2.5f \leqq R_1 \leqq -f \quad (1)$$

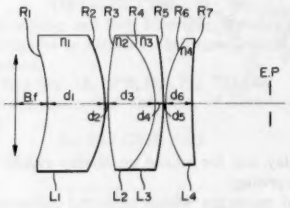
$$0.65 \leqq R_2/R_1 \leqq 1.2 \quad (2)$$

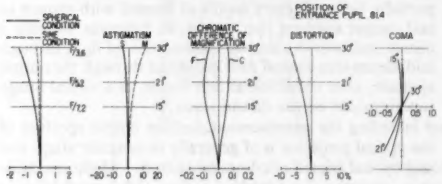
$$0.4f \leqq d_1 \leqq f \quad (3)$$

$$-1.2f \leqq R_4 \leqq -0.8f \quad (4)$$

$$30 < \nu_2 - \nu_3 \quad (5)$$

$$0.1 < n_3 - n_2 \quad (6)$$





$$-3.4f \leqq R_3 \leqq -2.7f \quad (7)$$

$$-1.8 \leqq R_3/R_5 \leqq -1.1 \quad (8)$$

$$f \leqq R_i \leqq 1.5f \quad (9)$$

where f represents the total focal length of said eyepiece lens system, R_1, R_2, . . . represent the curvature radii of the successive surfaces in order from front to rear, R_i represents the curvature radius of the front surface of said positive meniscus lens component of said third lens group, d_1 represents the axial thickness of said positive meniscus component of said first lens group, n_2, n_3, ν_2 and ν_3 represent the refractive indices and the Abbe numbers of said biconvex element and said negative meniscus element of said cemented positive doublet component, respectively; and wherein said lens system satisfies the following data:

total focal length 100.0, back focal length 32.4
F-number 3.6, apparent field of view 60°, eye relief 84.5

$R_1 = -188.9$	$d_1 = 62/5$	$n_1 = 1.62041$	$\nu_1 = 60.3$
$R_2 = -139.2$	$d_2 = 1.7$		
$R_3 = 341.7$	$d_3 = 50.0$	$n_2 = 1.62041$	$\nu_2 = 60.3$
$R_4 = -94.2$	$d_4 = 8.3$	$n_3 = 1.80518$	$\nu_3 = 25.5$
$R_5 = -288.6$	$d_5 = 1.7$		
$R_6 = 120.5$	$d_6 = 29.2$	$n_4 = 1.71300$	$\nu_4 = 53.9$
$R_7 = 1916.7$			

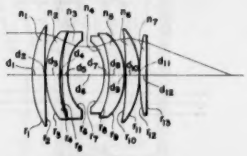
where R_1, R_2, . . . represent the curvature radii of the successive surfaces in order from front to rear, d_1, d_2, . . . represent the axial distances between successive surfaces of the lenses, n_1, n_2, . . . and ν_1, ν_2, . . . represent the refractive indices and Abbe numbers, respectively, of the respective lens components.

4,099,843

COMPACT LARGE-APERTURE PHOTOGRAPHIC LENS SYSTEM WITH LONG BACK FOCAL LENGTH

Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Mar. 1, 1977, Ser. No. 773,407
Claims priority, application Japan, Mar. 2, 1976, 51-22482
Int. Cl.[2] G02B 11/32
U.S. Cl. 350—176 7 Claims



1. A compact large-aperture photographic lens system with long back focal length comprising a first, second, third, fourth fifth and sixth lens components, said first lens components being a positive meniscus lens, said second lens component being a positive meniscus lens, said third lens component being a negative meniscus lens, said fourth lens component being a cemented meniscus doublet, said fifth lens component being positive meniscus lens, said sixth lens component being a positive lens, said compact large-aperture photographic lens system with long back focal length satisfying the following conditions:

$$(L/f) < 1 \ (L = \Sigma d) \quad (1)$$

$$0.6f < -r_8 < 1.1f \quad (2)$$

$$0.1 < n_4 - n_5 < 0.2, \ 24 < \nu_5 - \nu_4 < 35 \quad (3)$$

$$-\frac{0.85}{f} < \frac{2}{(n_2 + n_3)f_{23}} + \frac{2}{(n_4 + n_5)f_{45}} < -\frac{0.65}{f} \quad (4)$$

$$1.5 < r5/r4 < 1.87, \ d_4 < 0.05f \quad (5)$$

$$0.16f < d_3 + d_4 + d_5 < 0.19f, \ 0.14f < d_7 + d_8 < 0.17f \quad (6)$$

$$1.7 < n_1, n_2, n_3, n_4 < 1.86 \quad (7)$$

$$1.6 < n_5, n_6, n_7 < 1.82 \quad (8)$$

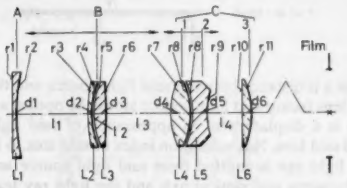
$$40 < \nu_5, \nu_5, \nu_7 < 60 \quad (9)$$

Wherein reference symbol L represents the overall length of the lens system, reference symbol r_4 represents the radius of curvature of the surface on the image side of the second lens component, reference symbol $r5$ represents the radius of curvature of the surface on the object side of the third lens component, reference symbol $r8$ represents the radius of curvature of the cemented surface of the fourth lens component, reference symbols $d3$ and $d5$ respectively represent thicknesses of the second and third lens components, reference symbols $d7$ and $d8$ respectively represent thicknesses of respective lenses constituting the fourth lens component, reference symbol $d4$ represents the airspace between the second and third lens components, reference symbols n1 through $n7$ respectively represent refractive indices of respective lenses, reference symbols $\nu4$ and $\nu5$ respectively represent Abbe's numbers of respective lenses constituting the fourth lens component, reference symbols $\nu6$ and $\nu7$ respectively represent Abbe's numbers of the fifth and sixth lens components, reference symbol f represents the focal length of the lens system as a whose, reference symbol $f23$ represents the total focal length of the second and third lens components and reference symbol $f45$ represents the focal length of the fourth lens component.

4,099,844
VARIABLE FOCAL LENS HAVING A DIVERGENT FRONT ELEMENT

Ludwig Bertele, ch-9658 Wildhaus, Switzerland

Filed Sep. 27, 1976, Ser. No. 727,232
Claims priority, application Switzerland, Sep. 29, 1975, 12625/75
Int. Cl.[2] G02B *15/14*
U.S. Cl. 350—184 6 Claims



1. A lens whose focal length is variable in about the double range, consisting of a front lens element (A) facing the longer beam length and having divergent refractive power, a lens component (B) displaceable over the airspace following thereon and having positive refractive power, and a basic objective (C) having positive refractive power, the lens components being constructed as follows:

(a) the divergent front lens element contains a concavity facing in the direction of the shorter beam length of the lens;

(b) the displaceable convergent lens component following thereon comprises at least a divergent meniscus facing the front element and a convergent glass whose more sharply curved surface faces the front element;

(c) the basic objective consists of a fixed part, and a movable part having negative refractive power and which through the shape of its outer surfaces constitutes a meniscus curved in the direction of the front lens element, and at least a convergent glass and a biconcave glass facing the shorter beam length;

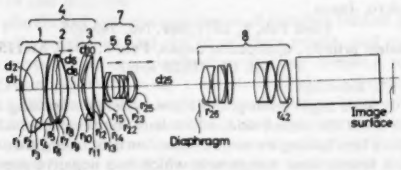
(d) the displacement of the movable part of the basic objective amounts to only a fraction of that of the convergent lens component (B), and the two movable parts are coupled together in such a manner that this displacement takes place in the same direction;

(e) the fixed part of the basic objective has a convergent action and its more sharply curved outer surface faces the shorter beam length.

4,099,845
ZOOM LENS WITH ABERRATION VARIATION PREVENTED FOR FOCUSING

Kunio Takesi, and Kazuo Tanaka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1976, Ser. No. 746,203
Claims priority, application Japan, Dec. 4, 1975, 50-144664
Int. Cl.[2] G02B *15/14*
U.S. Cl. 350—184 4 Claims



1. A zoom lens capable of preventing aberration variation for focusing which comprises:

a front lens part which consists of, from the object side, a first fixed lens group, a movable lens group and a second fixed lens group and which possesses a positive refractive power irrespective of the position of the movable lens group, the first fixed lens group having a negative refractive power while both the movable lens group and the second fixed lens group having positive refractive powers; for re-focusing from a distant object onto a near object, the movable lens group moves in the direction of an image of the object;

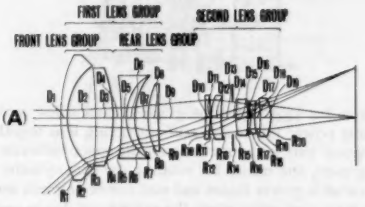
a zooming lens part which is provided with at least two movable lens groups, the zooming lens part being disposed on the image side of said front lens part; and

an image forming lens group disposed on the image side of said zooming lens part.

4,099,846
VARIABLE MAGNIFICATION LENS SYSTEM

Naoto Kawamura, Inagi; Akira Tajima, Kawasaki, and Katumi Tanaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1976, Ser. No. 719,389
Claims priority, application Japan, Sep. 8, 1975, 50/108635
Int. Cl.[2] G02B *15/14*
U.S. Cl. 350—186 2 Claims



1. A variable magnification optical system comprising, from front to rear in the direction in which light enters said system from the object side, a first lens component of negative power and a second lens component of positive power which remains stationary during focusing with an axial air separation between said first and said second components being variable to effect variation of magnification of an object, said first component is divided into a rear lens group of negative power and a front lens group, said front lens group including at least one positive lens and at least one negative lens with the positive lens disposed closest to an image plane in the front lens group, the absolute value of the focal length of said front lens group being larger than that of the focal length of either said rear lens group or said second component, said front and said rear lens groups being movable so that when said first lens component is axially moved toward the front to focus down to shorter object distances, the axial air separation between said front and said rear groups is decreased from that occurring before the focusing operation is performed.

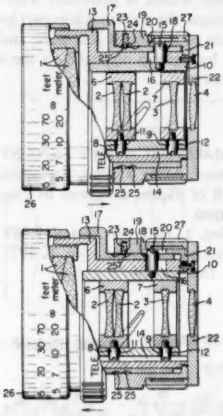
4,099,847
ZOOM LENS SYSTEM CAPABLE OF CLOSE-UP PHOTOGRAPHY

Yukio Ito, Suwa, Japan, assignor to Nitto Kogaku Kabushiki Kaisha, Japan

Filed Sep. 3, 1976, Ser. No. 720,272
Claims priority, application Japan, Sep. 8, 1975, 50-108674
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—187 1 Claim

1. A zoom lens capable of close-up photography comprising a lens system including positive focusing lenses, negative variable power lenses, a negative correcting lens and a positive fixed lens or including positive focusing lenses, negative variable power lenses, a positive correcting lens, and a negative

fixed lens, characterized by a main lens-barrel having a straight groove parallel to an optical axis thereof, a cam cylinder mounted in said main lens-barrel and having cam grooves formed therein, said variable power lenses and said correcting lens having respective lens-barrels mounted in said cam clyinder in spaced relation, pins extending from said lens-barrels through said cam grooves into said straight groove in said main lens-barrel, means for moving said cam cylinder between a rearward position for ordinary photography and a forward



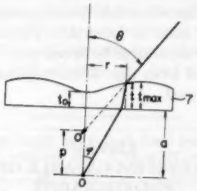
position for close-up photography, means for moving said variable power lenses and said correcting lens together along the optical axis without changing the space between said two lens groups, and means for rotating the cam cylinder to move said variable power lenses and said correcting lens toward and away from each other along the optical axis due to engagement of said pins with said cam and straight grooves, whereby adjustment of the focus for close-up photography can be made in the same way as in a zooming operation when the cam cylinder is in said forward position.

4,099,848

OPTICAL CORRECTION LENS

Kuniharu Osakabe, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 24, 1976, Ser. No. 660,779
Claims priority, application Japan, May 30, 1975, 50-64262
Int. Cl.[2] G02B *3/04*; G03B *41/00*
U.S. Cl. 350—189 **1 Claim**



1. A correction lens of an axially symmetrical configuration provided with a continuous curved surface having a minimum thickness at the center portion thereof and a maximum thickness in the radial intermediate portion between the center and the periphery and so designed that a light source located along the optical axis of said correction lens at one side thereof can be observed from the opposite side through said correction lens in such a manner that said light source is in appearance displaced toward said correction lens by a constant distance on the optical axis independently of observing angles, and in which thickness t of said lens at a radial distance r from the optical axis of said lens is given by following formulae:

$$\frac{dt}{dr} = \frac{\sin\theta - \sin\phi}{\sqrt{N^2 - \sin^2\phi} - \cos\theta}$$

$$\tan\theta = \frac{r}{a - p + t}$$

$$r = a \cdot \tan\phi + \frac{\frac{t \cdot \tan\phi}{N}}{\sqrt{1 + (1 - \frac{1}{N^2}) \tan^2\phi}}$$

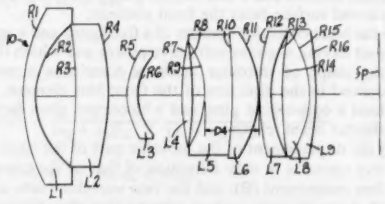
wherein a is distance between said light source and the surface of said lens facing said light source along the optical axis of said lens, p is a displacement in appearance of said light source toward said lens, N is refraction index of said lens, ϕ is angle at which light ray is emitted from said light source and θ is an angle between said optical axis and the light ray leaving said lens.

4,099,849

WIDE ANGLE OBJECTIVE

John A. Lawson, Scarborough, and Ellis I. Betensky, Toronto, both of Canada, assignors to Vivitar Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 392,118, Aug. 27, 1973, abandoned. This application Jul. 29, 1974, Ser. No. 492,403
Int. Cl.[2] G02B *9/64*
U.S. Cl. 350—214 **33 Claims**



1. A lens of the retrofocus type which comprises a plurality of lens elements arranged in six groups along a common optical axis from the object end to the image end as follows: a first group of negative power including positive and negative lens element, a second negative group in the form of a meniscus having a concave image side surface, a third positive group having a convex object side surface, a fourth positive group having a concave object side surface and convex image side surface, a fifth negative group consisting of a meniscus having a convex object side surface, and a sixth positive group consisting of a biconvex doublet.

4,099,850

WIDE ANGLE PHOTOGRAPHIC LENS

Sei Matsui, Chiba, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 4, 1977, Ser. No. 765,605
Claims priority, application Japan, Feb. 5, 1976, 51-11566
Int. Cl.[2] G02B *9/60*
U.S. Cl. 350—215 **6 Claims**

1. A wide angle photographic lens system comprising in the order from the object side, a first lens component which is a positive lens having its more convex surface facing the object side, a second lens component which is a negative meniscus lens having its convex surface facing the object side, a third lens component which is a biconvex lens having its more convex surface facing the object side, a diaphragm, a fourth lens component which is a biconcave lens, a fifth lens component

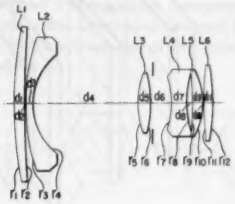
which is a positive meniscus lens having its convex surface facing the image side, and a sixth lens component which is a biconvex lens, said lens system satisfying the following conditions:

$$1.5f < |f_{12}| < 1.75f \quad (1)$$

$$5.0 < f_1/|f_2| < 8.0 \quad (2)$$

$$0.1 < d_1 + d_2 + d_3/d_4 < 0.35 \quad (3)$$

$$0.5f < r_4 < 0.6f \quad (4)$$



where f is the total focal length of the lens system, f_1 and f_2 are the focal lengths of the first and the second lens components, respectively, f_{12} is the combined focal length of the first and second lens components, r_4 is the curvature radius of the surface of the second lens component which faces the image side, d_1 and d_3 are the center thicknesses of the first and the second lens components, respectively, and d_2 and d_4 are the air spaces between the first and second lens components and between the second and third lens components, respectively.

4,099,851

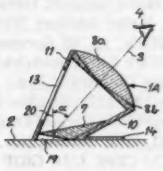
READING AID

Gerard Rethore, 22, rue Garibaldi, 34 Meze, France

Filed May 7, 1976, Ser. No. 684,011

Int. Cl.² G02B 7/02

U.S. Cl. 350—246 **9 Claims**



1. A reading aid for persons of impaired vision, comprising:

an elongate lens mount with a base positionable on a horizontal surface carrying a text to be read, said base having a bottom slot adapted to register with at least part of a line of said text; and

a plurality of optical components of elongate outline generally paralleling said slot in said lens mount, said components including a positively refracting eyepiece remote from said slot having a longitudinal plane of symmetry inclined at an acute angle to a vertical plane longitudinally bisecting said slot, another of said components lying between said slot and said eyepiece to refract vertical light rays from a centerline of said slot toward said inclined longitudinal plane, said eyepiece having a center transversely offset from the centerline of said slot in the direction of refraction of said vertical light rays by said other of said components.

4,099,852

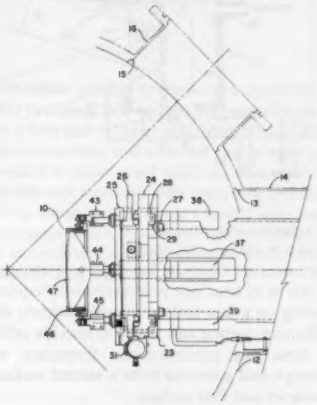
LENS POSITIONER WITH FIVE DEGREES OF FREEDOM

Marian W. Kobierecki, and Frederick Rienecker, Jr., both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 5, 1976, Ser. No. 729,632

Int. Cl.² G02B 7/02, 7/08

U.S. Cl. 350—247 **1 Claim**



1. A lens positioner for positioning lenses precisely with five degrees of freedom of motion consisting of three translations and two angular rotations in combination with a vacuum chamber and means for supporting same in said vacuum chamber, whereby said lens positioner can be remotely controlled, said lens positioner comprising: a base assembly, an X-stage assembly movably mounted with respect to said base assembly, a Y-stage assembly movably mounted with respect to said X-stage assembly, actuator means for individually moving said X-stage and Y-stage assemblies, three torsion assemblies operatively supported by said Y-stage assembly, actuator means for individually moving said torsion assemblies, and means movably connected to said torsion assemblies for retaining at least one lens, whereby selective activation of said actuator means, produces translations in X, Y, and Z axis motions and angular rotations α and β of the lens retaining means; said supporting means comprising a support and feed-through spool operatively mounted in an opening in said vacuum chamber, said support and feed-through spool having flanged end sections, one of said flanged end sections being secured to said base assembly of said lens positioner, the other of said flanged end sections being adapted to be connected to apparatus for directing a light beam through said lens positioner into said vacuum chamber, said support and feed-through spool being additionally provided with means for sealably securing therein an electrical feed-through assembly, said electrical feed-through assembly being operatively connected to said actuators of said lens positioner and to a remotely located actuator controller.

4,099,853

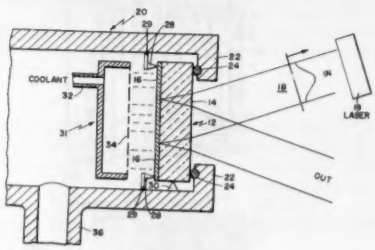
LOW DISTORTION MIRROR FOR HIGH POWER LASER BEAMS INCLUDING A REAR REFLECTIVE SURFACE

Sheldon L. Glickler, Natick, and Paul G. DeBaryshe, Lincoln, both of Mass., assignors to Jersey Nuclear-AVCO Isotopes, Inc., Bellevue, Wash.

Continuation of Ser. No. 583,786, Jun. 4, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,300

Int. Cl.[2] G02B *5/08, 5/28*

U.S. Cl. 350—310 21 Claims



1. A reflector comprising:

a reflective element having:

a transparent substrate having a low absorption to radiation of at least one predetermined frequency; and

a coating on a first surface of said substrate defining a rear reflective coating and tuned to provide reflection of said at least one predetermined frequency when passing through said substrate from a second surface thereof opposite to said first surface;

means for mounting said reflective element to expose the second surface thereof whereby a radiation may be received thereon for reflection of the radiation from said rear reflective coating;

said mounting means mounting said reflective element substantially free to expand to relieve stress therein; and

cooling means for applying a cooling fluid directly to the first surface of said reflective element having said rear reflective coating thereon.

4,099,854

OPTICAL NOTCH FILTER UTILIZING ELECTRIC DIPOLE RESONANCE ABSORPTION

Donald L. Decker, Ridgecrest, and William M. Tolles, Monterey, both of Calif., assignors to The Unites States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 12, 1976, Ser. No. 731,285

Int. Cl.[2] G02B *5/24*

U.S. Cl. 350—312 22 Claims

21. An optical notch filter comprising;

a suspending material selected from the group consisting of air, KBr, NaF, CaF_2, BaF_2, LiF, KCl, NaCl, KRS-5 and ZnSe; and

a plurality of absorbing particles within said suspending material to form a colloidal system said particles having a dielectric constant such that a resonant absorption condition exists for a given wavelength of incident radiation, and being small in size relative to said wavelength, wherein said absorbing particles are selected from the group consisting of MgO, BeO, αAl_2O_3, BN, $Ag_{1-x}Cd_x$ alloy system, $Ag_{1-x}Zn_x$ alloy system and Ag.

4,099,855

LIQUID CRYSTAL DISPLAY ARRANGEMENTS

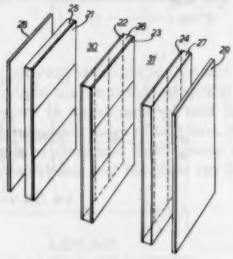
Philip Henry Wisbey, Colchester, and George Elliot, Sandon near Chelmsford, both of England, assignors to The Marconi Company Limited, England

Filed Oct. 1, 1976, Ser. No. 728,845

Claims priority, application United Kingdom, Oct. 4, 1975, 40696/75

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—333 10 Claims



1. A liquid crystal display arrangement including two planar liquid crystal cells placed one behind the other, both cells containing twisted-nematic liquid crystal material and being positioned between a pair of crossed polarizers, and matrix means associated with each cell for addressing selected areas of the display arrangement, each said matrix means comprising discrete conductive stripes defining a row-column matrix, one matrix being adapted to have applied thereto row and column address voltages which are of relatively opposite polarities and the other matrix being adapted to have applied thereto row and column address voltages which are of the same polarities so that the optical rotations effected by the address voltages of the two cells at the cross talk areas thereof have a combined effect which is subsantially removed by the last polarizer.

4,099,856

NEMATIC LIQUID CRYSTALLINE SUBSTANCES

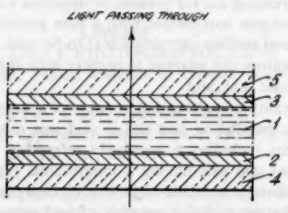
Wolfgang Weissflog, Halle-Neustadt; Hermann Schubert, Nehlitz; Horst Kresse, Halle; Adalbert Wiegeleben, Halle, and Dietrich Demus, Halle, all of German Democratic Rep., assignors to VEB Werk für Fernsehelektronik, Berlin-Oberschoneweide, German Democratic Rep.

Filed Jul. 20, 1973, Ser. No. 381,324

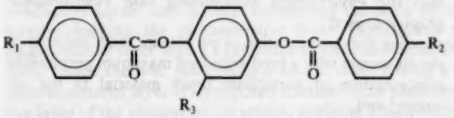
Claims priority, application German Democratic Rep., Oct. 5, 1972, 166044; Nov. 23, 1972, 167034; Nov. 23, 1972, 167033

Int. Cl.[2] C09K *3/34;* G02F *1/13*

U.S. Cl. 350—350 27 Claims

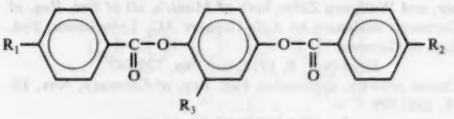


1. In a system comprising means for generating an electric or magnetic field and a composition comprising at least one nematic liquid crystalline compound retained in the field, the improvement in which at least one of the nematic liquid crystalline compounds is



in which R_1 and R_2 each is C_nH_{2n+1}— or $C_nH_{2n+1}COO$—, n being an integer of from 1 to 10, and R_3 is Cl—, Br—, CH_3—, C_2H_5—, CH_3CO— or CH_3OOC—.

25. In a system comprising means for generating an electric or magnetic field and a composition comprising at least one nematic liquid crystalline compound retained in the field, the improvement in which at least one of the nematic liquid crystalline compounds is



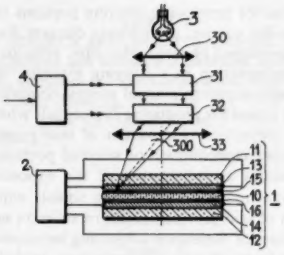
in which R_1 and R_2 each is $C_nH_{2n+1}O$—, n being an integer of from 1 to 10, and R_3 is CH_3CO— or CH_3OOC—.

4,099,857

THERMO-OPTIC LIQUID-CRYSTAL DEVICE FOR REAL-TIME DISPLAY OF ANIMATED IMAGES

Michel Hareng, and Serge Le Berre, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 18, 1975, Ser. No. 632,955
Claims priority, application France, Nov. 21, 1974, 74 38281
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—351 **2 Claims**



1. A method of utilizing a thermo-optical effect for real-time display of successive images in the form of scattering points in a thin transparent layer of a material exhibiting a mesomorphic state with direct transition to an isotropic liquid state comprising the steps of:

maintaining said layer in uniform orientation at a first temperature in said mesomorphic state;

temporarily heating said points to a second temperature in said isotropic liquid state;

subsequently cooling from said isotropic liquid state to said mesomorphic state in uniform orientation so that light scattering cybotactic zones are transitorily formed in said points; and

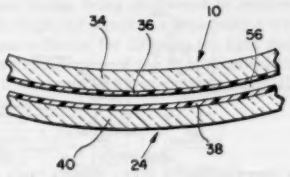
applying an AC voltage during the transition from said isotropic liquid state to said mesomorphic state to reduce the duration of the cybotactic zones and to maintain said layer transparent in said mesomorphic state.

4,099,858

VARIABLE LIGHT TRANSMISSION OPHTHALMIC DEVICE

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 1, 1976, Ser. No. 701,873
Int. Cl.[2] G02C *7/12*; G02B *1/10, 11/04*
U.S. Cl. 351—62 **2 Claims**



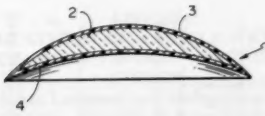
1. In an ophthalmic device comprising a spectacle frame member adapted to engage first and second pairs of light polarizing elements, a first pair of light polarizing elements fixedly held by said frame member, and a second pair of light polarizing elements which is superposed with the first pair of light polarizing elements and rotatable with respect to said first pair of light polarizing elements to provide variable light transmission, the improvement which comprises a hydrophobic coating on each of the immediately adjacent surfaces of said fixed and rotatable light polarizing elements.

4,099,859

CONTACT LENS HAVING A SMOOTH SURFACE LAYER OF A HYDROPHILIC POLYMER

Edward W. Merrill, Cambridge, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Continuation of Ser. No. 528,681, Dec. 2, 1974, abandoned, which is a division of Ser. No. 311,819, Dec. 4, 1972, Pat. No. 3,916,033, which is a continuation-in-part of Ser. No. 299,711, Oct. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 172,538, Aug. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 151,377, Jun. 9, 1971, abandoned. This application Dec. 27, 1976, Ser. No. 754,892
The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.[2] G02C *7/04*; C08F *2/54*
U.S. Cl. 351—160 **6 Claims**

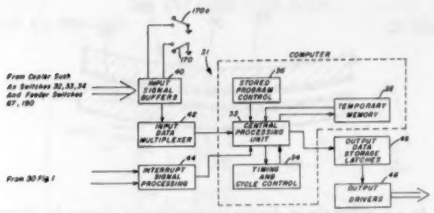


1. An optically clear, oxygen-permeable contact lens comprising a core formed from a crosslinked silicone polymer or copolymer having groups responsive to ionizing radiation by the formation of graft initiating free radical sites and an optically smooth surface layer formed from a hydrophilic polymer produced by the free-radical polymerization of at least one vinyl monomer, said layer being grafted to the core by the direct addition of said vinyl monomer to free radical sites produced on or from said groups by ionizing radiation without the intervention of oxygen.

4,099,860
COPIER/DUPLICATOR PRIORITY INTERRUPT APPARATUS

John L. Connin, Canandaigua, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,895
Int. Cl.[2] G03G 21/00
U.S. Cl. 355—14 3 Claims



1. In copier/duplicator apparatus for producing production runs having predetermined copies of documents, priority interrupt apparatus for interrupting a first lower priority production run and producing a second higher priority production run and thereafter completing the first production run comprising:

(a) memory means for receiving and storing first and second individual production run signals indicating the number of copies of first and second documents to be made respectively;

(b) switch means effective when actuated for producting a first production run interrupt signal indicating that a second production run has a higher priority than said first production run;

(c) means responsive to said interrupt signal for stopping said first production run and for storing in said memory means production run completion signals which are a function of the remaining number of copies of said first production run which have to be made;

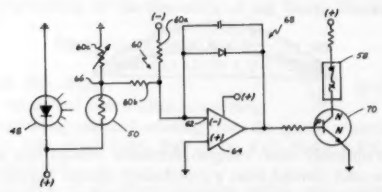
(d) means responsive to said second production run signals for causing said copier/duplicator to complete said second production run; and

(e) means conditioned after said second production run has been completed to be responsive to said completion signals for causing said copier/duplicator to complete the remaining copies of said first production run.

4,099,861
CONTAMINATION SENSOR

Frank Bernard Abel, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,527
Int. Cl.[2] G03G 21/00
U.S. Cl. 355—15 7 Claims



6. A method of determining a malfunction condition in a vacuum cleaning apparatus for an electrophotographic copier, and shutting down the electrophotographic copier upon the occurrence of such malfunction condition, said method including the steps of:

determining the concentration of particulate toner material in the air stream of the vacuum cleaning apparatus immediately upstream of point at which said air stream passes into the environment surrounding said electrophotographic copier;

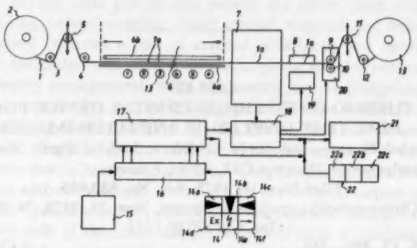
comparing the concentration of particulate toner material in the air stream with a predetermined maximum permissible concentration of particulate toner material in the air stream; and

shutting down the electrophotographic copier when the determined concentration of particulate toner material exceeds the predetermined maximum permissible concentration of particulate material.

4,099,862
METHOD AND APPARATUS FOR EVALUATING DEVELOPED PHOTOGRAPHIC FILMS PREPARATORY TO REPRODUCTION

Horst Bickl, Pullach; Günter Findeis, Sauerlach; Helmut Treiber, and Wolfgang Zahn, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Nov. 8, 1976, Ser. No. 739,547
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1975, 2551799
Int. Cl.[2] G03B 27/76, 27/78
U.S. Cl. 355—35 23 Claims



13. Apparatus for processing discrete portions of information on a web-like carrier, particularly discrete frames of an exposed and developed photographic film, prior to reproduction of such information in a copying machine of the type having adjustable exposure control means, comprising manually actuatable means for producing first signals when a person performing a subjective examination of said portions determines that proper reproduction of selected portions of information necessitates an adjustment of the exposure control means, including means for producing signals which denote the orientation of said portions of information on said carrier; evaluating means for thereupon subjecting successive portions of information to an objective examination, including means for producing second signals for adjustment of exposure control means based on said objective examination; and means for modifying said second signals as a function of the corresponding first signals prior to transmission of said second signals to the exposure control means.

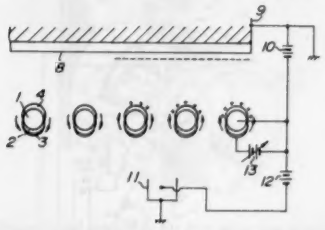
4,099,863
IMPROVED ELECTROGRAPHIC PROCESS FOR PRODUCING A PLURALITY OF COPIES

Toshio Nakatsubo, and Masaji Nishikawa, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1976, Ser. No. 744,268
Claims priority, application Japan, Nov. 27, 1975, 50-141113
Int. Cl.[2] G03G 15/00
U.S. Cl. 355—3 SC 2 Claims

1. An electrographic process for producing multiple copies, employing a photosensitive screen composed of four layers consisting of an insulating layer, two electric conductive layers

formed on diametrically opposite sides of said insulating layer and a photosensitive layer formed on one of said two electric conductive layers, said process comprising the steps of: uniformly charging the photosensitive layer, illuminating the photosensitive layer with a light image to form an electrostatic latent image thereon, positioning a record sheet having a dielectric material layer in an opposed relation to the photosensitive layer of the photosensitive screen, applying a high electric voltage across a grounded field electrode provided in the rear of the record sheet having the dielectric material layer and the electric conductive layer of the photosensitive screen, applying a bias electric voltage across the two electric conductive layers of the photosensitive screen, directing a flow of ions



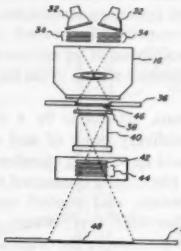
from a corona discharge device arranged at the side of and spaced apart from the electric conductive layer of the photosensitive screen through the photosensitive screen toward the record sheet, and forming an electrostatic charge image corresponding to the electrostatic latent image on the photosensitive screen on the record sheet having the dielectric material layer, repeating the steps of positioning said record sheet and the steps thereafter to obtain a plurality of copies, and changing the bias electric voltage applied across the two electric conductive layers of the photosensitive screen in a direction to compensate for the increasing attenuation of the electric latent image formed on the photosensitive layer when a plurality of copies is to be obtained.

4,099,864

LIGHT SOURCE FOR PHOTOGRAPHIC PRINTER

Patrick J. Gilligan, and Kenneth D. Schrupp, both of Minneapolis, Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Mar. 11, 1977, Ser. No. 776,875
Int. Cl.[2] G03B 27/54, 27/76
U.S. Cl. 355—37 **9 Claims**



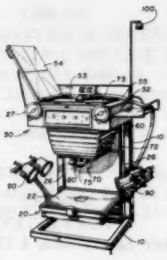
1. A light source for a photographic printer comprising:
a plurality of print lamps for providing light;
filter means for selectively modifying colors of the light from the plurality of print lamps;
heatsink means positioned around the plurality of print lamps for dissipating heat generated by the plurality of print lamps, the heatsink means comprising a blackened, baffled assembly positioned to receive and absorb heat radiated from the plurality of print lamps;
blower means for cooling the heat sink means and the plurality of print lamps;
a lamphouse enclosure within which the plurality of print lamps, the filter means, the heatsink means, and the blower means are mounted, the lamphouse enclosure having a window through which light from the plurality of print lamps is directed;
diffuser means for diffusing light from the plurality of print lamps to provide an essentially uniform light distribution, the diffuser means being positioned to receive the light passing through the window and including white porcelain diffuser reflector for diffusing the light and changing the progation direction of the light received through the window from essentially horizontal to essentially vertical and downward.

4,099,865

METHOD AND APPARATUS FOR MAKING COLOR SEPARATIONS FROM A COLOR TRANSPARENCY

Gerald V. Knippenberg, 5805 Stuart Ave. South, Edina, Minn. 55436

Filed Mar. 23, 1977, Ser. No. 780,433
Int. Cl.[2] G03B 27/54, 27/32
U.S. Cl. 335—37 **12 Claims**



1. A method for making color separations from masked color transparencies comprising: masking a color transparency with a black and white transparency having the same image thereon; directing a light source having a limited spectral band width onto the masked transparency to produce imaged light therefrom; directing the imaged light onto a film which has a predetermined color emulsion thereon responsive to the light having a limited spectral band width to expose the film emulsion to the imaged light; and repeating the steps using a light source having a limited spectral band width which is different from the first named light source and using a film having an emulsion which responds to the light source having the different limited spectral band width to produce separate films exposed to the imaged light having the differing spectral band widths.

4,099,866

FOCAL ADJUSTMENT ON A SINGLE-FOCUS LENS IN A CONTINUOUSLY VARIABLE MAGNIFICATION SYSTEM

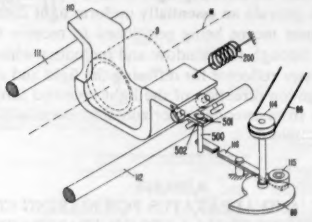
Rick Owen Jones, Longmont, and Michael Henry Ulrich, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1976, Ser. No. 748,810
Int. Cl.[2] G03B 27/36
U.S. Cl. 355—58 **4 Claims**

3. In a continuously variable reduction optical system wherein both the object and image planes are stationary, wherein a single focus lens is mounted on a lens carriage for movement to an infinite number of reduction positions between boundaries, wherein the lens is allowed a tolerance range relative to total conjugate length, and wherein the total conjugate length and the reduction ratio of the optical system

are set by moving optical path mirrors and the lens according to lens nominal values, a method of minimizing the focus error due to lens tolerance comprising the steps of:

at a first reduction ratio, adjusting the position of the lens and mirrors to achieve substantially zero focus error while maintaining the precise reduction ratio; and



at a second reduction ratio substantially distant from said first reduction ratio, adjusting the position of the lens carriage to achieve substantially zero focus error without affecting the adjustment of lens position at said first reduction ratio when said lens is returned to the first reduction ratio.

4,099,867

FILM PLATENS

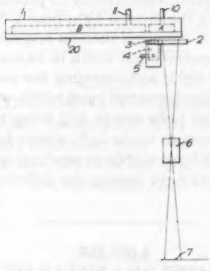
Harry Arthur Hele Spence-Bate, 1 Cheam Pl. Morley, Australia (6062)

Filed Aug. 11, 1976, Ser. No. 713,359

Claims priority, application Australia, Aug. 20, 1975, 2859/75

Int. Cl.[2] G03B *27/60, 27/32*

U.S. Cl. 355—73 **7 Claims**



1. A microfiche or microfilm camera incorporating a suction platen which comprises a single flat plate having a film receiving surface, a plurality of interconnected vacuum chambers enabled by means of suitable vacuum inlets to be connected to sources of vacuum, said plate forming one wall of said vacuum chambers, and a group of closely spaced generally parallel slots penetrating said plate and extending throughout substantially the entire length thereof and communicating directly between the chambers and the film receiving surface on the plate, said chambers being internally divided into two vacuum areas, one area corresponding to the title area of a microfiche and the other area corresponding to the area on which the principal information is recorded.

4,099,868

COPYING APPARATUS, IN PARTICULAR PHOTOPRINTING APPARATUS, COMPRISING A DEVELOPING CHAMBER WHICH OPERATES ACCORDING TO THE DRY-DEVELOPMENT PRINCIPLE, AND A DOSING DEVICE FOR LIQUID DEVELOPER MEDIUM

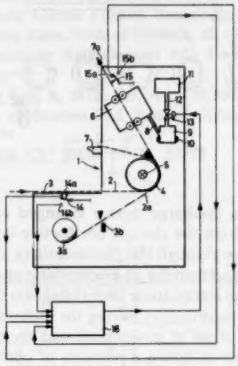
Herbert Schröter, Taunusstein, and Eckehard Stein, Frankfurt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,104

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613331

Int. Cl.[2] G03B *27/30*

U.S. Cl. 355—106 **6 Claims**



1. In a copying apparatus, particularly a photoprinting apparatus, comprising an exposure station, a developing chamber, and an evaporator associated with the developing chamber, in which a developer composed of an ammonia/water mixture is virtually completely evaporated and over-heated at a temperature above 100° C, preferably about 105° C, and at a predetermined pressure, preferably atmospheric pressure, the apparatus further including, for dosage of the ammonia/water mixture, a feed pipe connected with the evaporator, a valve connected with the feed pipe, and a control unit connected with the valve, whereby the rate of feed of the ammonia/water mixture may be adapted to different operating conditions,

the improvement comprising first switch means, actuatable by an original, positioned at an entrance for the original upstream of an exposure station in the feed direction of the apparatus,

second switch means, actuatable by a copying material, positioned at a delivery point of said copying material downstream of said developing chamber,

control unit means electrically connected with said first and second switch means, said control unit being so constructed that after said first switch means has been switched to a first position by the original, the valve is first opened for a relatively long period of time, and the valve is then alternately opened and closed, in accordance with pulses, as long as the first or second switch means is maintained in its first switching position by one or more originals or one or more sheets of copying material, respectively,

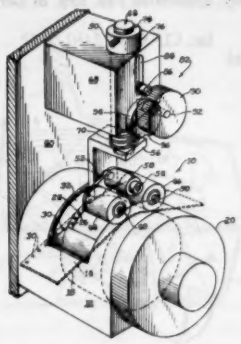
and said pulse-wise opening and closing of the valve is terminated only when neither the first nor the second switch means is maintained in its first switching position by an original or a sheet of copying material, respectively.

4,099,869

PRINTING HEAD ASSEMBLY

John W. Lang, Jr., Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 13, 1976, Ser. No. 750,084
Int. Cl.[2] G03B 27/10
U.S. Cl. 355—108 21 Claims



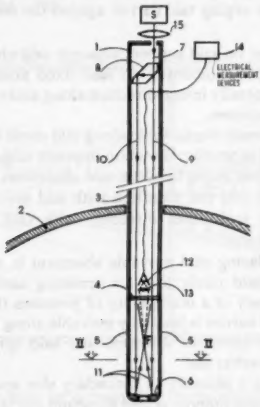
1. A printing head assembly for exposing raw stock film with a preprint film in a contact film printer, comprising:
- a printing head including a film printing aperture and a printing sprocket for engaging film sprocket holes;
- drive means connected to the printing sprocket for moving the raw stock film and preprint film past the printing aperture at a predetermined rate; and
- a pair of film engaging rollers for rollingly engaging the film on each side of the printing aperture for maintaining the raw stock and preprint film in contact with one another and in engagement with said printing sprocket through a predetermined arcuate segment thereof substantially greater than the length of said printing aperture.

4,099,870

OPTICAL PROBE FOR THE MEASUREMENT OF SPEEDS IN A FLUID FLOW

Antoine Luzzi, Echirolles, France, assignor to Societe General de Constructions Electriques et Mecaniques Alsthom s.a., Paris, France

Filed Mar. 8, 1977, Ser. No. 775,679
Claims priority, application France, Mar. 12, 1976, 76 07161
Int. Cl.[2] G01P 3/36
U.S. Cl. 356—28 3 Claims



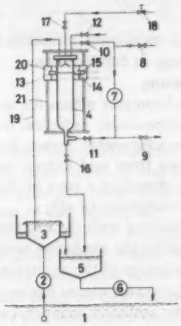
1. A device for optical measurement of local speed and turbulence in a fluid flow by the method based on the Doppler effect or the interference fringe method, said device comprising:
- a probe for insertion in the flow, said probe comprising a first sealed tube part having one end immersed in said flow,
- a sealed window within said one end,
- means for transmitting incident light through said first part and said window,
- a second, open support part forming an extension of said first tube part and extending within said flow beyond said window,
- a reflector at the end of said second support part for receiving said incident light beams emanating from said window and for reflecting said light beams directly back towards said window and causing them to converge and intersect at a measurement point between said reflector and said window, within said open support part and to pass through said window into said first sealed tube part, and
- a light detection device positioned within said first tube part in the path of reflected light beams converging at said measurement point for detecting variations of light at the measurement point and to deduce therefrom the component of speed of said flow at said measurement point.

4,099,871

METHOD AND APPARATUS FOR DETERMINATION OF ACTIVATED SLUDGE VOLUME INDEX

Hiroshi Sunahara, Seto; Yutaka Ishihara, Anjyo; Kazuhiko Tanaka, Nagoya, and Yuko Morimoto, Kyoto, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo and Yanagimoto Manufacturing Co., Ltd., Kyoto, both of, Japan

Filed Jun. 22, 1976, Ser. No. 698,319
Claims priority, application Japan, Jun. 24, 1975, 50-78236
Int. Cl.[2] G01N 21/24; B01D 21/02
U.S. Cl. 356—73 4 Claims



1. An apparatus for the determination of the activated sludge volume index, which comprises, in combination, means for metering and introducing into a test cell a mixed liquor of activated sludge sampled at the outlet of the aerator or in the final settler, means for blowing air into the test cell for thereby agitating the sample uniformly, means for determining the intensity of transmitting light and the intensity of scattering light in the sample, calculating the logarithm of the ratio of said intensity of scattering light to said intensity of transmitting light and thereby determining the concentration of activated sludge, means for optically following the sedimentation interface of activated sludge in the sample and determining the sedimentation rate of activated sludge within a fixed length of time, an arithmetic circuit adapted to calculate the activated sludge volume index on the basis of the concentration of activated sludge and the sedimentation rate of activated sludge, washing means for discharging the used sample from the test

cell and washing the interior of the test cell and automatic process control means for automatically and continuously operating said means for introducing and metering the sample, said means for agitating the sample in the test cell, said means for determining the concentration of activated sludge, said means for determining the sedimentation rate of activated sludge, said arithmetic circuit and said washing means, whereby the activated sludge volume index is automatically determined, displayed, recorded and transmitted.

4,099,872

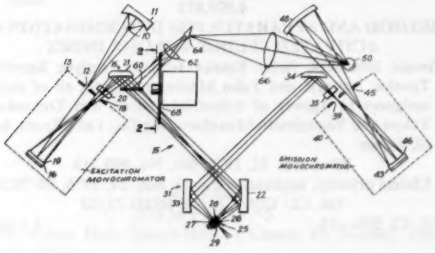
FLUORESCENCE SPECTROPHOTOMETER

John U. White, Contentment Island Rd., Darien, Conn. 06820

Continuation-in-part of Ser. No. 639,804, Dec. 11, 1975, Pat. No. 4,022,529. This application Oct. 12, 1976, Ser. No. 731,765

Int. Cl.[2] G01J *3/30, 3/42*

U.S. Cl. 356—85 **19 Claims**



1. Apparatus for measuring radiation from a sample, the apparatus comprising, in combination:

a source of radiation;

excitation monochromator means for isolating an excitation beam of monochromatic radiation from said source, the excitation monochromator means having means for receiving radiation from said source, an excitation exit slit, and means for directing a part of the received radiation through said excitation exit slit;

first means cooperating with the excitation monochromator means for directing the excitation beam to said sample and for forming an image of the excitation exit slit;

emission monochromator means for isolating radiation from said sample, the emission monochromator means having an emission entrance slit for receiving an emission beam of radiation from said sample, an emission exit slit, and means for directing monochromatic radiation from the emission beam through said emission exit slit;

second means cooperating with the emission monochromator means for directing the emission beam to the emission entrance slit and for forming an image of said emission entrance slit;

said excitation beam and said emission beam having axial rays which intersect at said sample, and each of said images having a longitudinal axis which lies in the plane defined by said axial rays; and

radiation detecting means for receiving the monochromatic radiation from the exit slit of the emission monochromator means;

said first and second means each comprising a plurality of optical elements including a pair of aspherically concave mirrors angularly related to each other.

4,099,873

ARRANGEMENT FOR THE SPECTRAL ANALYSIS OF SUBSTANCES

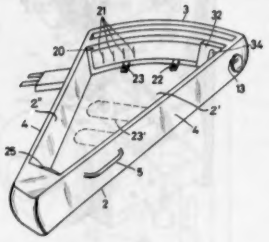
Ulrich Grisar, and Wilhelm Berstermann, both of Georgsmarienhütte, Fed. Rep. of Germany, assignors to Klockner-Werke AG, Fed. Rep. of Germany

Filed Mar. 10, 1976, Ser. No. 665,770

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1975, 2513358

Int. Cl.[2] G01J *3/30, 3/12*

U.S. Cl. 356—86 **7 Claims**



1. An apparatus for spectroscopically analyzing the composition of a workpiece, comprising,

a portable support;

means including an electrode juxtaposable with a surface of said workpiece for sparking between said surface and said electrode;

optical means on said support for transmitting into said support the light of a spark between said electrode and said surface;

a reflective Rowland grating in said support defining therein a Rowland circle;

an arcuate guide in said support having a pair of spaced parallel walls conforming to and extending along said Rowland circle;

a carrier displaceable along said guide between said walls and dimensioned to have some freedom of movement in direction towards and away from said walls;

means including a primary slit on said carrier displaceable therewith along said Rowland circle for casting the light from said optical means on said Rowland grating;

means including at least one guide spring located intermediate and bearing upon said carrier and one of said walls of said guide for urging said carrier against the other of said walls;

a fixed abutment on said support adjacent said circle;

an abutment spring mounted on said fixed abutment and extending generally in one direction along said circle from said fixed abutment;

a movable abutment displaceable along said circle in said one direction and in another direction opposite said one direction, said carrier being between said abutments and being engageable in said one direction with said movable abutment and in said other direction with said abutment spring;

means for displacing said movable abutment in said directions along said circle and for arresting said movable abutment at any of a multiplicity of positions therealong, whereby said carrier is limitedly movable along said guide between said movable abutment and said spring when embraced thereby; and

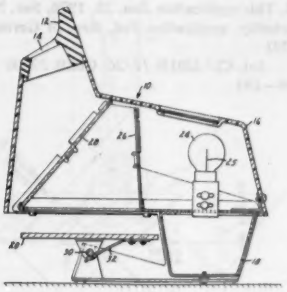
means including a plurality of secondary slits spaced apart and fixed on said support at said Rowland circle for breaking the light reflected by said Rowland grating down into an analyzable spectrum.

4,099,874

DETECTING SYSTEM

Robert J. Oliveira, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 601,384, Aug. 4, 1975, Pat. No. 3,992,096.
This application Jul. 12, 1976, Ser. No. 704,172
Int. Cl.[2] G01N *15/02*
U.S. Cl. 356—102 2 Claims



1. A viewer for detecting the presence of lightinteracting domains of a predetermined size in a medium comprising:

a housing having a viewing window in the top portion thereof;

a viewing stage in the lower portion of said housing for supporting the medium positioned to be seen through said viewing window, said viewing stage being capable of generating multipoint illumination when illuminated from below;

a lamp positioned below said viewing stage to provide a light source; and

means for moving said viewing stage in one or more directions;

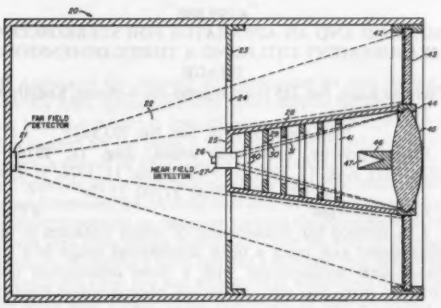
whereby scintillation can be observed as light is transmitted through said medium when light interacting domains of a predetermined size are present in the medium.

4,099,875

COAXIAL MULTI-DETECTOR SYSTEM AND METHOD FOR MEASURING THE EXTINCTION COEFFICIENT OF AN ATMOSPHERIC SCATTERING MEDIUM

Donald H. McMahon, Carlisle, and James B. Thaxter, Townsend, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,473
Int. Cl.[2] G03B *27/10*
U.S. Cl. 356—103 16 Claims



1. In a system for determining the extinction coefficient of an atmospheric scattering medium, apparatus comprising:

transmitter means for irradiating the scattering medium whose extinction coefficient is to be determined with a series of pulses of radiation directed along a predetermined propagation path,

near field receiver means responsive to radiation backscattered from first scattering elements disposed in the near field of view within said predetermined propagation path for producing a first receiver output,

far field receiver means responsive to radiation backscattered from second scattering elements disposed in a far field of view concentric with said predetermined propagation path for producing a second receiver output, and

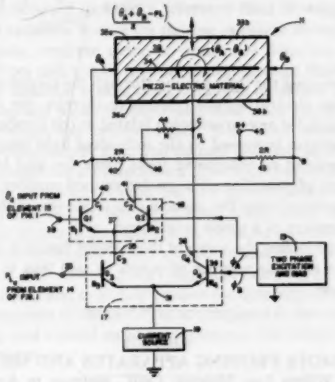
processor means responsive to said first and second receiver outputs for providing a measure of the extinction coefficient for said atmospheric scattering medium with respect to both said first and said second scattering elements.

4,099,876

PHASE-CODED CONTROL FOR RING LASER GYRO

Adrian K. Dorsman, Bellflower, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 14, 1977, Ser. No. 777,369
Int. Cl.[2] G01B *9/02*; G01P *9/00*
U.S. Cl. 356—106 LR 10 Claims



4. In a laser gyro, laser optics adjustment means comprising

a mirror within the laser optics of said laser gyro mounted upon a three-terminal duo-mode bimorph device for duo-mode modulation of said optics, and

a two-stage differential amplifier responsively coupled to a source of two mutually phase coded reference signals for separately dithering each mode of the duo-mode bimorph device, each stage being further responsive to a mutually exclusive one of a first and second synchronously detected photodetector laser output of said laser gyro, whereby closed loop control of said laser optics is effected.

4,099,877

LENS TESTING METHOD AND APPARATUS

Willem Brouwer, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

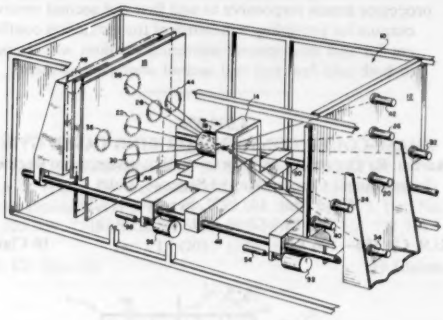
Filed Oct. 13, 1976, Ser. No. 732,044
Int. Cl.[2] G01B *9/00*
U.S. Cl. 356—124 27 Claims

1. A method of testing a lens of a type normally having an indefinite number of focal planes within a specified focal range including the steps of:

A. projecting individual light images from a first plurality of apertures in an aperture mounting structure through said lens toward a plurality of targets carried on a target mounting member, each target having a second plurality

of apertures whose configurations are all generally geometrically similar to the configurations of said first plurality of apertures and the number of apertures of the second plurality being substantially greater than the number of the first plurality,

B. moving the mounting structure and target mounting member with respect to one another to cause individual light images from said first plurality of apertures to traverse the plurality of apertures of individual targets, respectively,



C. detecting the light passing through the targets and generating electric signals responsive thereto, the number of signals for any target being related to the number of target apertures traversed by the individual light images,

D. locating an acceptable focal plane for said lens on the basis of detection of a predetermined number of signals generated from the passage of a single image through the apertures of a single target; and

E. determining the value of the transfer function of said lens at a multiple number of points in said lens in said focal plane.

4,099,878

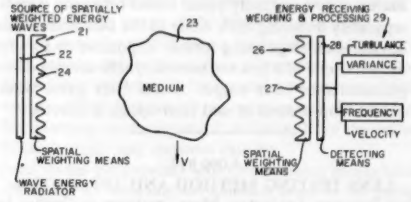
REMOTE PROBING APPARATUS AND METHOD

Robert Wilton Lee, Manton, Calif., assignor to Argosystems, Inc., Palo Alto, Calif.

Continuation of Ser. No. 562,875, Mar. 28, 1975, abandoned. This application Nov. 23, 1976, Ser. No. 744,351

Int. Cl.[2] **G01N** *71/46, 9/24;* **G01J** *1/00*

U.S. Cl. 356—128 **22 Claims**



1. Apparatus for remote sensing of a refractivity index structure only at a selected region in a fluid transmission medium comprising solely means forming and transmitting spatially weighted divergent propagating waves of energy having a transmit spatial frequency through said fluid medium to interact with said fluid medium and means for receiving and spatially weighting at a receive spatial frequency said waves after transmission through said fluid transmission medium and generating output signals indicative of the refractive index structure, said transmit and receive spatial frequencies determining the selected region between the transmitting means and the receiving means where said refractivity index structure is sensed.

4,099,879

OPTICAL ANTENNA OR LENS

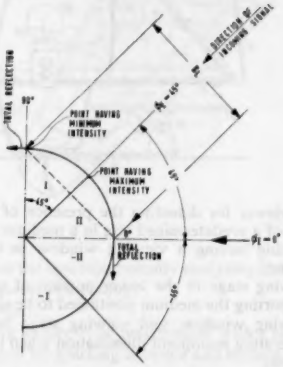
Hans Ernst Britz, Ludwig-Quidde-Str. 23, 6000 Frankfurt am Main 56, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 447,814, Mar. 4, 1974, Pat. No. 3,953,131. This application Jan. 23, 1976, Ser. No. 651,809

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1975, 2360781

Int. Cl.[2] **G01B** *11/26;* **G02B** *27/00*

U.S. Cl. 356—141 **16 Claims**



5. A method for the evaluation of the information received from an opto-electronic antenna system having a plurality of stationary antennas disposed on a prescribed geometrical surface, the optical axis of each antenna having an elevation and azimuth and being disposed at a solid angle with respect to the optical axes of the other antennas and intercepting a single base point comprising the steps of:

obtaining voltage components from a plurality of detectors connected to selected ones of the plurality of antennas;

modifying the phase of the obtained voltage components by the neighboring solid angle components in elevation and azimuth;

forming a resultant quotient from the modified voltage components; and

calculating accurate information of the direction of the solid angle associated with the information received in elevation and azimuth on the basis of the resultant quotient.

4,099,880

METHOD AND AN APPARATUS FOR STEREOSCOPIC MEASUREMENT UTILIZING A THREE-DIMENSIONAL IMAGE

Tsutomu Kano, No. 225 Hanakoganei-cho 4-chome, Kodaira-shi, Tokyo, Japan

Filed Oct. 19, 1976, Ser. No. 733,967

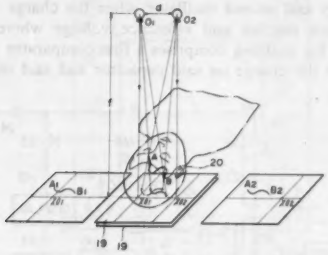
Claims priority, application Japan, Aug. 11, 1976, 51-107157[U]; Aug. 11, 1976, 51-95802; Aug. 11, 1976, 51-95803

Int. Cl.[2] **G01B** *9/00, 11/00, 11/24*

U.S. Cl. 356—164 **4 Claims**

1. A method for measurement of actual distances in three dimensional axes using a three dimensional image in a three dimensional measurement with a three dimensional image obtained from two stereoscopically photographed films of a subject and a distance between centers of an optical axis and a distance between a light source and film, wherein said three dimensional image is prepared with a first film in which a center of a first optical axis is recorded and a second film in which a center of a second optical axis is recorded, a first

marker which slides on said first film is moved to align with the center of the first optical axis of the first film, a second marker which slides on said second film is moved to align with the center of the second optical axis of said film, said first and second markers are moved to a first measuring point to align the first and second markers with said first measuring point on the three dimensional image, distances from said first measuring point to said center of the first optical axis and center of the



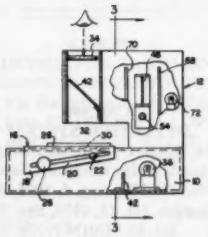
second optical axis in directions of axes *x*, *y* and *z* are measured, calculated and recorded, the first and second markers are moved to a second measuring point to align on the three dimensional image, and distances from said second measuring point to said center of the first optical axis and said center of the second optical axis in directions of axes *x*, *y* and *z* are measured, calculated and recorded to measure linear distances between two points.

4,099,881

VIEWER FOR BIOLOGICAL DIFFUSION PLATE

Jan A. Vanden Broek, and James A. Carney, both of Ann Arbor, Mich., assignors to Transidyne General Corporation, Ann Arbor, Mich.

Filed Sep. 19, 1975, Ser. No. 614,875
Int. Cl.[2] G01B *11/02*; G01N *21/16*
U.S. Cl. 356—171 **6 Claims**



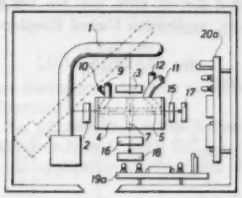
1. Apparatus for viewing and measuring an area having a relatively high optical diffusion characteristic occurring on a plate having a relatively low diffusion characteristic, comprising: a support for the plate; a viewing area fixed relative to the support; a source of light operative to illuminate the side of a plate opposite to the side facing said viewing area; baffle means disposed between the viewing area and the illumination source operative to prevent an observer viewing the plate through the viewing area from seeing direct light from the source; measuring indicia, including a fixed line and a movable line, supported parallel to the fixed line and adjustable in a direction normal to both lines, said indicia being supported so that an observer viewing the plate from the viewing area cannot observe the indicia; and an optical element supported between the viewing area and the plate for rendering the indicia visible through the viewing area so as to be superimposed on the image of the plate seen through the viewing area by an observer.

4,099,882

APPARATUS FOR OPTICALLY ANALYZING FLUIDS

Lars-Göran Hjalmar Andrén; Rune Harald Bjorkman, both of Upsala, Sweden; Richard Lee Easterday, Martinsville, N.J., and Hans Gösta Munktell, Upsala, Sweden, assignors to Pharmacia Fine Chemicals AB, Upsala, Sweden

Filed Oct. 13, 1976, Ser. No. 731,870
Claims priority, application Sweden, Oct. 29, 1975, 7512125
Int. Cl.[2] G01J *3/50*; G01N *21/26, 1/10*
U.S. Cl. 356—181 **19 Claims**



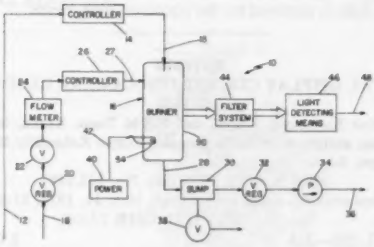
1. A fluid analyzer for measuring optical properties comprising first and second elongated flow ducts, one duct being adapted to have a test fluid flowing therethrough and the other duct being adapted to have a reference fluid flowing therethrough, a radiation source for passing radiation through fluid in said ducts, separate detector means for detection of the radiation from said source that has passed through fluid in said ducts, said radiation source being arranged to radiate along at least two optical paths through each flow duct, the first path passing through the corresponding flow duct substantially along the longitudinal direction thereof and the second path passing through the corresponding flow duct transverse to the longitudinal direction thereof, the first optical paths being of equal lengths and the second optical paths being of equal lengths, the length of the first optical paths being substantially greater than the lengths of the second optical paths, and each pair of first and second paths being provided with separate detector means, and evaluation means for determination of the optical properties of the test fluid as compared to the reference fluid along said optical paths in response to the output of said detector means.

4,099,883

SULFUR DETECTING APPARATUS COMPRISING HOLMIUM, AND ERBIUM FILTERS

Abraham William Berger, 17 Westbourne Rd., Newton, Mass. 02159, and Harry Eugene Stubbs, P.O. Box 686, Boston, Mass. 02102

Filed Feb. 7, 1977, Ser. No. 765,950
Int. Cl.[2] G01N *3/48*; G02B *5/22, 5/20*
U.S. Cl. 356—187 **4 Claims**



1. In sulfur detecting apparatus wherein a sample is excited to emit light and having light detecting means arranged to receive said light, and an optical filter system positioned to filter said light passing to said light detecting means, the im-

provement wherein said filter system provides a signal path for light passing to said detecting means, said signal path containing holmium and erbium, the quantities of holmium and erbium in said signal path being selected so that the optical transmission in said signal path is preponderantly in a wavelength interval 5 nm wide and including the wavelength 374 nm.

4,099,884

OPTICAL INSPECTION SYSTEMS

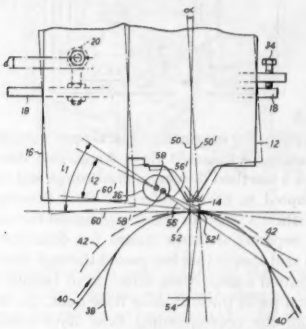
Paul Nash, Kinfauns, Worthing Rd., Horsham, Sussex, England

Filed Jul. 23, 1976, Ser. No. 708,049

Claims priority, application United Kingdom, Jul. 25, 1975, 31221/75

Int. Cl.[2] G01N *21/32*

U.S. Cl. 356—200 **10 Claims**



1. Apparatus for detecting blemishes in sheet material arranged to flow past an inspection head of the apparatus, comprising light source means arranged to direct light onto the sheet material and photosensitive means in the inspection head arranged to receive light reflected from or transmitted through the sheet material as it passes the inspection head, in which means are provided for adjusting the relative sensitivity of the apparatus to mechanical and optical defects, in which the light source means are arranged on the same side of the path of sheet material as the photosensitive means, the photosensitive means being arranged to receive light reflected from sheet material as it passes the inspection head, and means are provided for varying the mean angle of incidence of light falling onto the area of sheet material from which light is reflected to the photosensitive means, in which there is provided a cylindrical roller over which sheet material is trained as it passes the inspection head, the head includes a collimating system by means of which the photosensitive means receives only light reflected from a narrow strip-like area of the surface of the sheet material extending parallel to the axis of the roller, and the means for adjusting the angle of incidence of the light includes means for adjusting the collimating system so as to displace circumferentially relative to the light source means the area of the surface from which light is received by the photosensitive means.

4,099,885

DIGITAL DISPLAY CIRCUIT FOR CAMERA EXPOSURE METER

Masahiro Kawasaki, Tokyo, and Eiichi Tano, Asaka, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1976, Ser. No. 741,435

Claims priority, application Japan, Nov. 14, 1976, 51-136926

Int. Cl.[2] G01J *1/42*; G01R *17/06*

U.S. Cl. 356—223 **2 Claims**

1. A digital display circuit for a photographic exposure meter, comprising:

(a) a constant current source,

(b) a capacitor coupled to said constant current source,

(c) a first oscillator for controlling the discharge of said capacitor and the charging thereof from said constant current source,

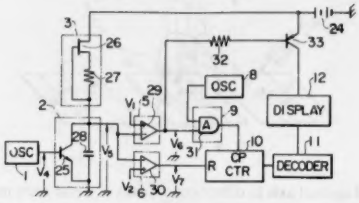
(d) a second oscillator,

(e) a counter,

(f) a reference voltage source,

(g) a light measuring circuit for producing an output voltage proportional to the logarithm of the brightness of a photographic object,

(h) means for enabling the counter to register pulses generated by said second oscillator when the charge on said capacitor reaches said reference voltage wherein said means for enabling comprises a first comparator responsive to the charge on said capacitor and said reference



voltage, means for terminating the counter operation when the charge on said capacitor subsequently reaches the output voltage of said light measuring circuit wherein said means for terminating comprises a second comparator responsive to the charge on said capacitor and the output voltage of said light measuring circuit, and wherein the output of said first comparator is connected to a reset input of said counter, and further comprising an AND gate having its inputs connected to the outputs of said second comparator and said second oscillator and its output connected to a count input of said counter,

(i) means for digitally displaying the number of pulses registered by said counter.

4,099,886

DETECTING SYSTEM

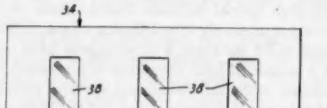
Robert J. Oliveira, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 601,384, Aug. 4, 1975, Pat. No. 3,992,096.

This application Jul. 12, 1976, Ser. No. 704,175

Int. Cl.[2] G01N *21/04*

U.S. Cl. 356—244 **3 Claims**



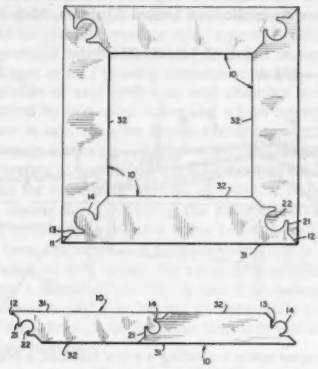
1. A test card for preforming immunological tests on the surface thereof comprising a flat substrate which generates a multiplicity of discreet light beams of predetermined size when illuminated by a single light source having deposited thereon at least one dried immunological test reagent.

4,099,887

STRUCTURAL JOINTS

Einhard Mackenroth, Lower Salem La., South Salem, N.Y. 10590

Filed Jul. 18, 1977, Ser. No. 816,391
Int. Cl.[2] F16D 1/00; F16L 25/00
U.S. Cl. 403—4 6 Claims



1. An article of manufacture, comprising:

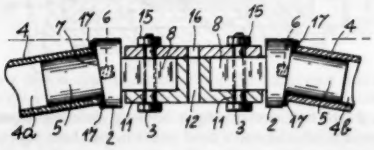
first and second members, said first member having a portion beveled at an angle of 45°, said second member having a portion beveled at an angle of 45°, said beveled portion of the first member including a recessed portion, said recessed portion including a cylindrical rib which extends outwardly beyond the plane of the beveled portion of the first member, said beveled portion of the second member including a projecting portion, said projecting portion including an open cylindrical groove which extends inwardly beyond the plane of the beveled portion of the second member, said first and second members being joined together at the beveled portions by a joint of said rib being fitted in said groove.

4,099,888

JUNCTION DEVICE FOR TRIDIMENSIONALLY EXTENDING TRUSSED STRUCTURES

Giovanni Simone, Via Bacchiglione, 14, Milan, Italy

Filed May 17, 1977, Ser. No. 797,695
Claims priority, application Italy, May 17, 1976, 23324 A/76
Int. Cl.[2] F16B 7/00
U.S. Cl. 403—172 10 Claims



1. A junction device for tridimensionally extending trussed structures, of the type designed to connect structural bars, by which the bays are defined, with one another, the device comprising a central connecting core having an axis, said core having a plurality of radially directed seats formed thereon, said seats having respective axes which are orthogonal with respect to said axis of said core;

a plurality of coupling elements which are to be secured to ends of respective structural bars and can be partially and coaxially inserted into said radially directed seats each said coupling element having an outwardly directed end formed as an enlarged portion which has a surface in a plane inclined with respect to said axis of said core;

locking means fitted to said seats for fastening said coupling elements to said core; and

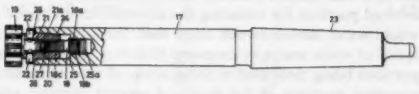
a plurality of tangs which are to be coupled with ends of respective structural bars, each said tang having an axis perpendicular to said inclined plane of a respective one of said enlarged portions and being of a size determined by the size of a structural bar with which it is to be connected.

4,099,889

REAMER

Istvan Vig, Olten, Switzerland, assignor to Merz AG Dulliken, Dulliken, Switzerland

Division of Ser. No. 622,856, Oct. 16, 1975, Pat. No. 4,040,765.
This application May 6, 1977, Ser. No. 794,526
Claims priority, application Switzerland, Oct. 18, 1974, 13983/74
Int. Cl.[2] B23B 31/04
U.S. Cl. 408—239 R 9 Claims



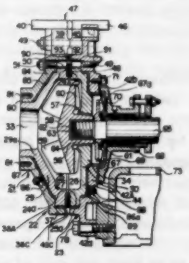
1. A reamer comprising a tool shank having at one end means for engagement in the lathe spindle of a machine tool and at the other end a conical socket; a reamer head having an integral conical butt for seating engagement in said socket to achieve precision alignment of said head with said tool shank; and means for releasably securing the conical butt in said socket, said releasable securing means comprising a screw threaded recess at the bottom of said conical socket, a screw-threaded recess in the inner end of said conical butt, and a securing rod having screw threads on its opposite ends for engagement with both said recesses.

4,099,890

IMPELLER TYPE PUMP HAVING SEAL MEANS AND PROTECTIVE MEANS

Yoshio Murakami, Tanashi, and Takezo Nakazawa, Higashi, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd. and Mitsui Kinzoku Engineering Service Co., Ltd., both of Tokyo, Japan

Filed Dec. 17, 1975, Ser. No. 641,525
Claims priority, application Japan, Aug. 21, 1975, 50-115143[U]; Sep. 30, 1975, 50-133444[U]; Sep. 30, 1975, 50-133445[U]
Int. Cl.[2] F04D 29/08, 7/02
U.S. Cl. 415—170 A 4 Claims



1. a front casing comprising first ceramic main portion defining therein an inlet, one part of a pump chamber and one half

of a discharge port, and a first protection member covering the first ceramic main portion;

a back casing confronting the front casing and comprising a second ceramic main portion defining therein the other part of the pump chamber and the other half of the discharge port, and a second protection member covering the second ceramic main portion;

a plurality of projections each having a flattened end surface, extending toward the second protection member and formed in spaced relation with each other on that marginal surface of the first protection member which confronts the second projection member;

a plurality of projections each having a flattened end surface, extending toward the first protection member and formed in spaced relation with each other on that marginal surface of the second protection member which confronts the first protection member, said projections of the second protection member being so arranged that the flat end surfaces of the projections of the second protection member abut against the respective flat end surfaces of the projections of the first protection member;

a continuous packing disposed between the marginal areas of the first and second ceramic main portions; and

narrowed portions for reducing the circumferential speed of waste water therebetween more than the circumferential speed of waste water in the pump chamber, said narrowed portions being provided at those areas of the confronting marginal portions of the first and second ceramic main portions which are adjacent to the pump chamber inwardly of said packing.

4,099,891

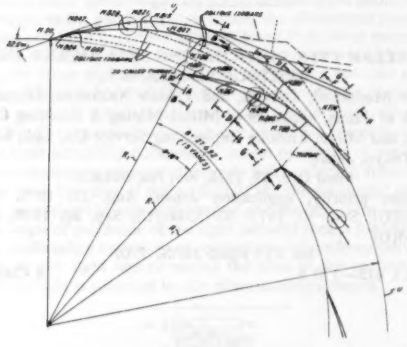
SAWTOOTHED DIFFUSER, VANED, FOR CENTRIFUGAL COMPRESSORS

Kenneth Campbell, Ridgewood, N.J., assignor to Miriam N. Campbell, Oradell, N.J.

Filed Jul. 14, 1977, Ser. No. 815,787

Int. Cl.[2] F01D *1/02, 9/00*

U.S. Cl. 415—207 **6 Claims**



1. A vaned diffuser for centrifugal compressors, wherein, as applied to the radially inner portion of the whole diffuser, there are defined a plurality of passages each extending from an initial vane tip to a throat, said passages being bounded on their radially inner side by a vaneless open region each pair of adjacent passages being separated by a vane, the side-walls of each individual passage diverging radially outwardly from each other as sectioned on a plane parallel with and intersecting the impeller-diffuser axis, the relative dimensions of the cross sections of at least one pair of adjacent passages being such that the vane width between side-walls, of the separating vane which bounds the radially inner side of the outer of said 2 adjacent passages, is less than the width between side-walls of the other side of the same vane, which side bounds the radially outer side of the inner adjacent passage.

4,099,892

HELICOPTER ROTORS

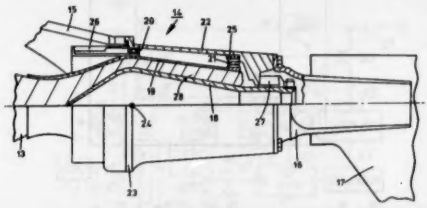
Alfred Charles Martin, Shepton Mallet, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed May 9, 1977, Ser. No. 794,944

Claims priority, application United Kingdom, May 11, 1976, 19446/76

Int. Cl.[2] B64C *27/38*

U.S. Cl. 416—134 A **7 Claims**



1. A helicopter rotor including a rotor hub and a plurality of rotor blades, the rotor hub comprising, for each rotor blade, a flexure member extending generally radially from the hub and being flexible in a blade flap plane, a feathering hinge located at an outer end of the flexure member and including a generally cylindrical portion rotatably mounted on axially spaced-apart inner and outer bearings on an extension of the flexure member, said inner bearing comprising a part-spherical bearing having a geometrical center, and resilient means associated with said outer bearing and arranged so as to permit, during operation, blade lead and lag movements of said cylindrical portion about the center of the inner bearing.

4,099,893

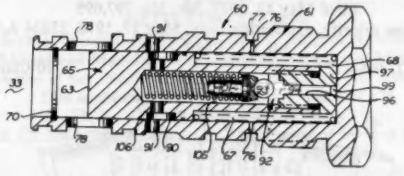
PUMP WITH ELECTRICALLY ACTUATED FLOW CONTROL

Jerry L. Coffman, Colfax, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 29, 1976, Ser. No. 736,732

Int. Cl.[2] F04B *49/08*

U.S. Cl. 417—300 **4 Claims**



1. A pump unit comprising a housing defining a pumping chamber, a fluid inlet and a fluid outlet in said housing communicating with said pumping chamber, a pair of cooperating gear members in said pumping chamber for pumping fluid from said inlet to said outlet, means supported in said housing defining a variable orifice in said outlet, said means defining said variable orifice including a part of a pintle member and a valve seat, means supporting said pintle member for movement relative to said valve seat to control the size of the variable orifice, an electric motor supported on said housing for moving said pintle member relative to said valve seat to control the size of said orifice, a flow control valve in said housing for bypassing fluid from said outlet to said inlet, said flow control valve including a spool valve member located in a bore in said housing and which is movable therein, said spool valve member

being positionable between a first position blocking communication between said inlet and outlet and a full relief second position providing maximum communication between said inlet and outlet to control bypassing of fluid from said outlet to said inlet, a spring biasing said spool valve member into said first position blocking communication between said inlet and outlet, said spring being located in chamber means at one end of said spool valve member, said spool valve member having one face surface acted upon by the pressure on one side of said orifice, said spool being movable by the pressure on one side of the orifice to said full pressure relief second position or a flow control position intermediate said first and second positions, flow passages in said housing communicating the pressure on the other side of said orifice to said chamber means, a pilot valve carried by said spool valve and which opens in response to pressure in said chamber means exceeding a predetermined value, passage means to said inlet communicating the pressure in said chamber means to inlet upon opening of said pilot valve, and means for restricting the rate of pressure build-up in said chamber means during relief of the pressure in said chamber means by opening of said pilot valve to cause said spool valve to move from a flow control position to said full pressure relief second position, said means for restricting pressure build up comprising a restricted portion of said flow passages and said passage means to said inlet having a substantially greater cross-sectional area throughout its extent than said restricted portion of said flow passage.

4,099,894

FUEL INJECTION FOR DIESEL ENGINES HAVING CONTROLLED-RATE PRESSURE RELIEF MEANS

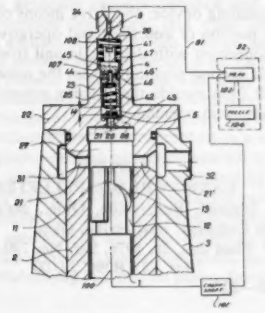
Jaromir Indra, Brno, Czechoslovakia, assignor to Vysoke uceni technicke, Brno, Czechoslovakia

Filed Jan. 15, 1976, Ser. No. 649,358

Claims priority, application Czechoslovakia, Jan. 15, 1975, 262-75

Int. Cl.[2] F04B *39/10;* **B05B** *1/30*

U.S. Cl. 417—499 **12 Claims**



1. In a piston-type injection pump for supplying fuel downstream over a discharge channel to a nozzle-type diesel injector, the pump comprising, in combination, a cylinder having a fuel supply port in a transverse wall thereof, a piston supported for reciprocation in the cylinder to define pressure and suction strokes of the pump, the piston having a profiled peripheral edge cooperable with the fuel supply port in the cylinder during the piston movement for effecting a flow of fuel through the fuel supply port, the space between the piston and the associated end of the cylinder defining a first chamber, means associated with the cylinder and disposed downstream of the first chamber for defining a second chamber separated from the first chamber, means providing fluid communication between the first and second chambers, the downstream end of the second chamber communicating with the upstream end of the discharge channel, discharge valve means supported for unobstructed movement in the second chamber between variable upstream and downstream positions, the valve means being movable upstream from a downstream position thereof at the end of each pressure stroke of the piston by a variable distance necessary to effect a drop of pressure in the discharge channel from the value then existing therein to a reference value and thereafter being movable downstream from the resulting variable upstream position during the next succeeding pressure stroke of the piston, and means disposed between the fuel supply port in the cylinder and the downstream end of the second chamber and independent of the second chamber defining a restricted passage for providing a fluid return path from the second chamber to the fuel supply port and for limiting the rate of pressure drop in the discharge channel.

4,099,895

STRUCTURE FACILITATING FUEL PUMP ASSEMBLING

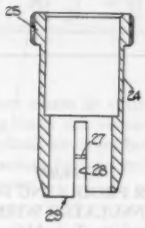
James Martin Anderton Askew, Brockworth, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 1, 1976, Ser. No. 746,440

Claims priority, application United Kingdom, Dec. 10, 1975, 50559/75

Int. Cl.[2] F04B *7/04, 39/10;* **F01B** *29/08*

U.S. Cl. 417—499 **4 Claims**



1. A fuel pumping apparatus comprising a body, a bore defined in the body, a reciprocable plunger mounted within the bore and having a portion extending from the bore, means for adjusting the angular setting of said plunger in the bore, said means comprising an annular angularly adjustable member surrounding said portion of the plunger and having side walls defining an open ended slot in said member, a lateral dog on the plunger engaging in said slot, the side walls defining said slot engaging with the side walls of the dog to determine the angular setting of the plunger, a head at one end of the plunger, a coiled compression spring, a spring abutment plate engaging the spring and head to urge the plunger in the direction out of the bore, the end face of the member being relieved over an area adjacent one of the side walls of the dog, said area being of a size to facilitate alignment of said plunger and said member whereby during assembly the plunger is moved into the bore until said relieved face of said member is engaged by the end face of the dog whereafter the engaging pressure is relaxed and the angularly adjustable member is moved angularly so as to bring a side wall defining the slot into engagement with a side wall of the dog thus accurately aligning the dog with the slot so as to permit further compression of the spring.

4,099,896

ROTARY COMPRESSOR

Rune Valdemar Glanvall, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

Filed Feb. 22, 1977, Ser. No. 770,354

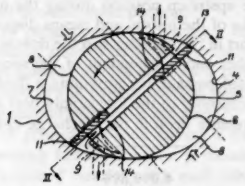
Claims priority, application Sweden, Feb. 26, 1976, 76024777

Int. Cl.[2] F04C *29/08*

U.S. Cl. 418—184 **3 Claims**

1. A rotary compressor of the vane type which comprises a housing having inlet ports for a gas to be compressed, the housing including end walls having outlet ports, a cylindrical

rotor journalled in the housing for rotation on an axis and provided with slots, an even number of vanes slidable in said slots and adapted to sealingly engage the inside wall surface of the housing to form working chambers between said rotor, said wall surface and said vanes, the rotor having recesses adapted



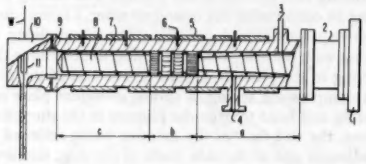
to cooperate with said outlet ports to form outlet passages for compressed gas, and piston means located radially inside each of said recesses in the rotor and connected to a diametrically opposed vane, each piston means being movable into the corresponding recess to fill up the same and thereby force the gas in the recess out through the corresponding outlet port.

4,099,897

APPARATUS FOR PRODUCING FOAMED PLASTIC INSULATED WIRES

Hideo Takano; Satoshi Saito; Tadashi Sato; Tuyoshi Yamaguchi, and Yoshihiro Narita, all of Ibaragi, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Nov. 4, 1975, Ser. No. 628,625
Int. Cl.² B29D *27/00*; B29G *7/02*
U.S. Cl. 425—4 C **14 Claims**



1. An apparatus for producing foamed plastic insulated wires including an extruding machine comprising a supply portion, said supply portion having means for receiving under pressure a molten thermoplastic resin and a foaming agent, a blend portion positioned to receive said resin and said foaming agent from said supply portion for blending said resin and foaming agent, and a metering portion positioned to receive blended resin and foaming agent from said blend portion for metering said blended resin and foaming agent to deliver same to a cross head, said supply, blend and metering portions being sections of an extrusion cylinder and an extrusion screw, said portions having respective extrusion coefficients α_1, α_2 and α_3 which are related to one another as follows:

$$\alpha_1 > \alpha_3 > \alpha_2$$

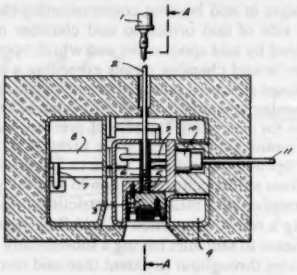
said extrusion coefficients being a function of screw contour and defining the volume extruded per revolution of the screw.

4,099,898

ARRANGEMENT FOR AND METHOD OF INSERTING A NOZZLE UNIT INTO AN OPENING OF A SPINNING DEVICE

Arnold Beck, Würen, Fed. Rep. of Germany, assignor to Büttner-Schilde-Haas Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 21, 1977, Ser. No. 779,939
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611940
Int. Cl.² B29C *1/16*; D01D *3/00*
U.S. Cl. 425—192 S **15 Claims**



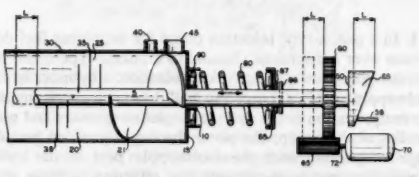
1. An arrangement for inserting a nozzle unit into an opening of a spinning device, comprising at least one shaft extending through the opening of the spinning device and having a first end portion facing towards the nozzle unit to be inserted and a second end portion facing away thereof, said shaft being movable between a first position in which it is located in said opening and said first end portion thereof extends outwardly beyond the opening, and a second position in which said first end portion is retracted into the opening; means for detachably connecting said first end portion of said shaft to the nozzle unit when said shaft is located in said first position and said first portion, as well as the nozzle unit is located outside the opening of the spinning device; and drive means connected to said second end portion of said shaft and operative for displacing said shaft connected with the nozzle unit from said first position into said second position so that the nozzle unit is pulled by said shaft from outside the opening towards the latter and thereupon into said opening.

4,099,899

CARBON BLACK PELLETER

Thomas J. Gunnell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 28, 1976, Ser. No. 700,435
Int. Cl.² B29C *23/00*
U.S. Cl. 425—222 **5 Claims**



1. A carbon pelleter adapted to agglomerate particle carbon black introduced therein with a wetting agent, said pelleter comprising:

(1) an elongated cylindrical chamber;

(2) a rotating shaft extending through said chamber, said shaft having mounted thereon pins projecting radially outward and closely fitting inside the chamber; and

(3) spring-loaded means actuated by a rotating disc for axi-

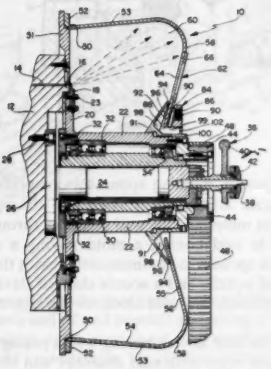
ally moving the rotating shaft back and forth during pelletizing operations so that the pins prevent formation of carbon deposits on the inside of the chamber.

4,099,900

PELLET COOLING SYSTEM

Christopher G. Bradbury, Rumford, R.I.; Walter Buchan, Norton, Mass.; Edward J. Winiarski, Pawtucket, R.I., and Gomer E. Kropa, North Reading, Mass., assignors to Leesona Corporation, Warwick, R.I.

Filed Dec. 6, 1976, Ser. No. 748,235
Int. Cl.[2] B29C *17/14*
U.S. Cl. 425—313 **11 Claims**



1. A pellet cage for cooling and collecting thermoplastic pellets formed by the cutting of strands of thermoplastic material emerging from the die face of an extruder or the like substantially into an air or other gaseous environment enclosing chamber by means of rotating cutters or the like which project said pellets in a generally radially outward and forward or downstream orientated trajectory, said cage comprising a hood having an arcuate peripheral side internal surface and a forward internal surface interconnected with each other and positioned with respect to said die face so as to in part form said enclosing chamber immediately downstream thereof for confining and receipt of said pellets as they are formed, first means for projecting a first flow of coolant in a substantially single pass peripheral orbit about and in contact with a major portion of said internal side surface and second means for simultaneously projecting a second flow of coolant over and in contact with a major portion of said internal forward surface so as to contact substantially all of said emerging pellets with one or both of said coolant flows to cool them, and means for continuously withdrawing said cooled pellets from said chamber.

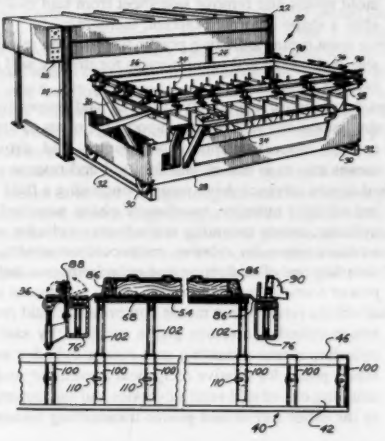
4,099,901

TABLE FOR PLASTIC FORMING APPARATUS

Jack N. Shuman, 3330 Foxcroft Rd., Charlotte, N.C. 28211

Continuation-in-part of Ser. No. 599,784, Jul. 28, 1975, Pat. No. 4,018,551. This application Jan. 7, 1977, Ser. No. 757,624
The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.
Int. Cl.[2] B29C *17/04*
U.S. Cl. 425—388 **9 Claims**

1. Apparatus for use in forming plastic material into predetermined configurations, said apparatus comprising a forming table including a central area having a plurality of upstanding support members arranged therein, means for selectively locating said upstanding support members at a plurality of positions within said central area, a vacuum forming mold having means for selectively mounting said vacuum forming mold at the upstanding ends of said plurality of support members, and a clamping frame having side elements defining an open area and having clamping means for engaging the side edges of a sheet of said plastic material, said side elements being selectively adjustable to vary the size of said open area, and said clamping frame being selectively movable to a position at which all of



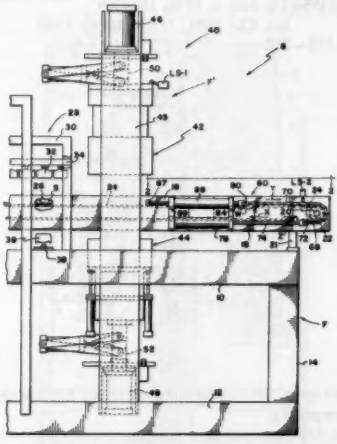
said plurality of support means lie within said open area defined by said clamping frame side elements and at which said side elements of said plastic sheet are held beneath the lowermost edges of said vacuum forming mold supported by said plurality of support means.

4,099,902

THERMOFORMING MACHINE

William Oberloier, Beaverton, Mich., assignor to Lyle Development, Inc., Beaverton, Mich.

Filed Feb. 28, 1977, Ser. No. 772,590
Int. Cl.[2] B29C *17/04*
U.S. Cl. 425—388 **16 Claims**



1. A differential pressure forming machine comprising:
endless sheet support means comprising a pair of laterally spaced, longitudinally extending, endless sheet support members movable in endless paths of travel for supporting a thermoplastic sheet;

means for heating said moldable, thermoplastic sheet to a forming temperature;

mold means for applying differential pressure to said heated sheet to form a shape therein;

means for intermittently incrementally indexing said endless support means to incrementally advance said sheet to said mold means and remove said sheet from said mold means after a shape is formed therein, including:

drive train means including power transmitting means movable in forward and reverse paths for driving said endless support members and

clutch means for selectively coupling said power transmitting means and said endless support members to drive said endless support members only when said drive train means moves in one of said forward and reverse paths;

fluid driven advance drive means comprising a fluid receiving advance cylinder; an advance piston mounted in said cylinder; means mounting said advance cylinder and said advance piston for relative, reciprocal movement; means coupling one of said piston and cylinder to one end of said power transmitting means; and

fluid driven return drive means comprising a fluid receiving return cylinder; a return piston received by said return cylinder; means mounting said return cylinder and said return piston for relative reciprocal movement; and means coupling one of said return cylinder and said return piston to the other end of said power transmitting means.

4,099,903

CORE FOR DEEP DRAW MOLDING A CLOSURE CAP FOR BOTTLES AND THE LIKE

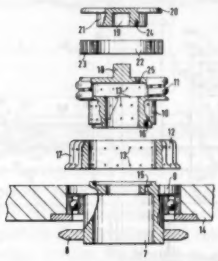
Zafir Petrov, Akazienweg 5-A, D-6710 Frankenthal, Fed. Rep. of Germany

Filed Apr. 12, 1977, Ser. No. 786,891

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 7611954[U]; Jun. 3, 1976, 2624969

Int. Cl.[2] **B29C** *17/04;* **B29D** *1/00*

U.S. Cl. 425—388 **5 Claims**



1. In an apparatus for forming a stepped closure cap, a mold core, comprising:

a rotatably mounted base portion;

an intermediate thread-forming portion secured to said base portion; and

at least one serration-forming portion mounted for rotation relative to said base portion and said thread-forming portion, said mold core being stepped in diameter, with the largest diameter being toward the bottom thereof.

4,099,904

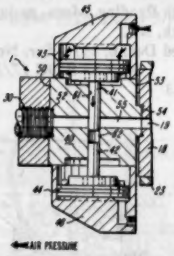
NOZZLE SHUT-OFF VALVE FOR INJECTION MOLDING MACHINE

James Earl Dawson, Lebanon, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 21, 1977, Ser. No. 789,533

Int. Cl.[2] **B29F** *1/03*

U.S. Cl. 425—563 **2 Claims**



1. In an injection molding apparatus comprising a chamber having a nozzle attached near one end thereof, means for forcing molten material from said chamber through a passageway formed in said nozzle, a mold having a sprue formed therein, which sprue is in communication with the passageway formed in said nozzle, and a nozzle shut-off device interposed between said nozzle and said chamber the improvement comprising:

(a) a body for said device having a first passageway in communication with both said chamber and the passageway formed in said nozzle and a second passageway intersecting said first passageway, and a third passageway substantially coaxial with said second passageway and having common intersection with said first and second passageway;

(b) a long pin reciprocal in said second passageway and having a length sufficient to extend at least along said second passageway, completely across said first passageway and to enter said third passageway;

(c) a short pin reciprocal in said third passageway but having a length less than said long pin length yet sufficient to extend completely along said third passageway and to protrude not more than partly across said first passageway and being substantially coaxial with said long pin;

(d) first and second pistons respectively engaging that end of said long pin and said short pin most remote from said first passageway;

(e) first and second cylinders encompassing said first and second pistons, respectively, each being mounted on said body and having means for connecting same to a fluid pressure source; and

(f) means in each of said cylinders to establish communication from one side of its said piston to a source of fluid pressure.

4,099,905

INJECTION MOLDING MACHINE BASE

Myrwin William Nash; John Kenneth Barry, and James Gordon Wiatt, all of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 29, 1977, Ser. No. 792,191

Int. Cl.[2] **B29F** *1/00*

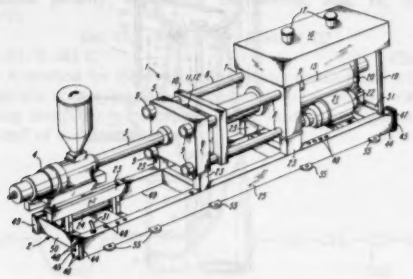
U.S. Cl. 425—589 **2 Claims**

1. A machine base for a hydraulic injection molding machine for molding plastic and resin material in a multiple part mold comprising

a generally rectangular body to be placed on a horizontal support surface, the sides of said rectangular body including a pair of opposed long side members connected together adjacent their ends by opposed short end members;

a plurality of longitudinally spaced apart mounting pads supported from and above said body for supporting machine elements thereon such as means to plasticate and inject plastic into a mold cavity, a fixed mold platen to receive part of a mold, and a fixed rear platen for supporting hydraulic clamping means;

one of the long side members of said rectangular body being a hollow elongated conduit defined by substantially axially straight walls;



a pair of removable closures each one sealably mounted on a respective end of said conduit and being of a size to seal off the entire cross section of said conduit and thus to expose said cross section for cleaning when removed;

an exit port through a conduit wall near one end of said conduit;

at least one inlet port through said conduit wall located between said exit port and at the other end of said conduit;

the passageway defined by said conduit being substantially the same cross section throughout the length thereof.

4,099,906

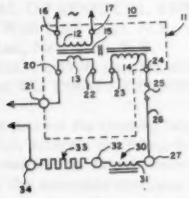
HOT SURFACE FUEL IGNITION SYSTEM

B. Hubert Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 20, 1976, Ser. No. 752,381

Int. Cl.[2] F23H *5/14*

U.S. Cl. 431—66 **10 Claims**



1. A hot surface fuel ignition system, including: hot surface igniter means having a negative temperature coefficient of resistance and a surface that reaches a temperature high enough to ignite a fuel when said igniter means conducts a predetermained electric current; fuel flow control means operated to an open position when carrying said electric current; current interruption means capable of continuous current conduction at said predetermined electric current level, but which open circuits when carrying a current higher than said predetermined electric current; regulating transformer means having a primary circuit adapted to be energized from a source of electric power and secondary circuit means; and said secondary circuit means connected in a series circuit with said igniter means, said fuel flow control means, and said current interruption means with said series circuit adapted to be completed by a control switch; said regulating transformer means supplying said predetermined electric current in said series circuit as long as the resistance of said igniter means is such as to cause said igniter means to be hot enough to ignite said fuel; said regulating transformer means supplying a current higher than said predetermined electric current upon said ignition means reaching a sufficiently low resistance to thereby cause said current interruption means to operate and deenergize said fuel flow control means.

4,099,907

IGNITION MECHANISM FOR A PYROPHORIC LIGHTER

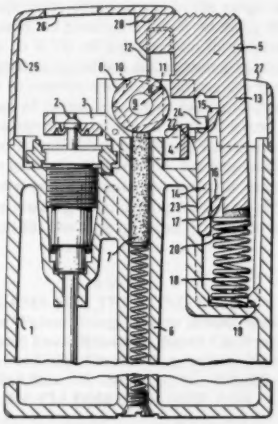
David Lee Fuller, Atlanta, Ga., assignor to Scripto, Inc., Atlanta, Ga.

Filed Oct. 4, 1976, Ser. No. 729,383

Claims priority, application United Kingdom, Oct. 6, 1975, 40816/75

Int. Cl.[2] F23Q *2/16*

U.S. Cl. 431—254 **9 Claims**



1. In a pyrophoric lighter having a spark wheel with ratchet teeth actuated by a manually operable press button pivotally mounted for arcuate motion around the spark wheel axis the improvement characterized by said press button comprising a unitary molded pivotal linkage having a plurality of bar por-

tions and integral flexible webs pivotally inter-connecting adjacent bar portions.

4,099,908

LOW PRESSURE GAS BURNER

Martin Josef Beckmann, 9719 - 75A St., and Ferris George Swann, 13903 - 47 Ave., both of Edmonton, Alberta, Canada

Filed Aug. 13, 1976, Ser. No. 714,093

Int. Cl.[2] F23Q *9/00*

U.S. Cl. 431—284 **3 Claims**

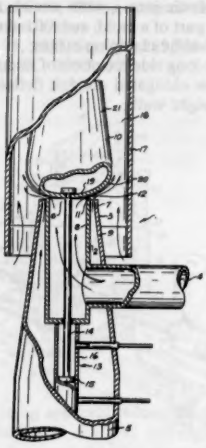
1. A burner for use in association with a relatively high pressure gas supply line and a relatively low pressure gas supply line, which comprises:

a tubular outer conduit for connection to the low pressure gas supply line and a tubular inner conduit for connection to the high pressure gas supply line, each conduit having an outlet end and an outlet;

the outlet end of said inner conduit being positioned within the outlet end of said outer conduit so that their outlets are substantially even in elevation;

said inner conduit forming a valve seat at its outlet;

a Coanda-type valve body having a curved surface, said valve body being positioned at the end of the inner conduit and arranged to seat in the valve seat and being axially displaceable from said seat whereby said valve body and valve seat co-operate to form an annular passage whereby high pressure gas flowing through said passage is deflected by and follows the curved surface of the valve body, thereby creating a low pressure zone adjacent said surface which functions to draw low pressure gas, from



the outer conduit, and air into the high pressure gas flow so that they mix and form a combustible mixture.

4,099,909

METHOD OF DYEING WITH DISPERSIBLE AZO ANILINO DYESTUFFS

Stefan Koller, Pratteln; Dieter Reinker, and Hans Rudolf Schwander, both of Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

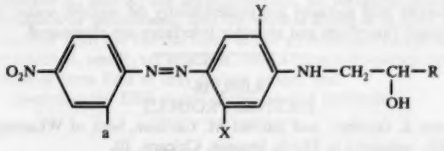
Continuation of Ser. No. 617,842, Sep. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 456,198, Mar. 29, 1974, Pat. No. 3,963,431, which is a continuation-in-part of Ser. No. 106,550, Jan. 14, 1971, abandoned. This application Mar. 7, 1977, Ser. No. 775,645

Claims priority, application Switzerland, Jan. 16, 1970, 628/70

Int. Cl.[2] C09B *27/00;* D06P *1/02*

U.S. Cl. 8—41 C **7 Claims**

1. A method for the dyeing of polyester textile fibers which comprises contacting the said polyester textile fibers with a dyeing composition containing as an essential component a dyestuff of the formula



wherein *a* is cyano, chlorine or bromine, R is ethyl, phenyl or phenoxymethyl, Y is chlorine, bromine and X is hydrogen, lower alkyl or lower alkanoylamino.

4,099,910

SURFACE MODIFICATION OF POLYMERIC SUBSTRATES VIA INTERACTION WITH AZIDO FORMYL OR AZIDO SULFONYL COMPOUNDS

John E. Herweh, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Jul. 29, 1977, Ser. No. 820,050

Int. Cl.[2] D06M *13/38*

U.S. Cl. 8—115.5 **11 Claims**

6. A process for forming an improved textile material comprising

(a) treating the surface of said textile material with a compound of the formula $R(CH_2)_mX$ wherein R is C_2 to C_{12} linear or branched fluoroalkyl, C_2 to C_{12} linear or branched alkoxy substituted C_2 to C_{12} alkyl, or C_2 to C_{12} linear or branched alkyl; $(CH_2)_m$ represents a linking group that is C_2 to C_{12} linear or branched alkylene; and X represents a sulphonazide or azidoformate and m is a whole number greater than 1;

(b) heating said treated textile material to a temperature of 130°-150° C. for a time sufficient to react the second compound with the textile material.

11. A woven or knitted textile material produced by the process of claim 6.

4,099,911

AMMONIA PROCESSING OF FABRICS-EFFECTIVE REMOVAL OF RESIDUAL AMMONIA

Jackson Lawrence, West Sand Lake, N.Y., assignor to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Jun. 14, 1976, Ser. No. 695,471

Int. Cl.[2] D06M *1/02, 1/00*

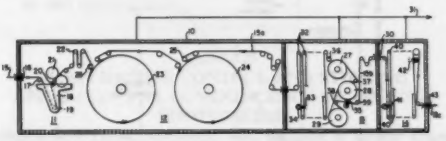
U.S. Cl. 8—125 **8 Claims**

1. In a continuous process for treating fabrics having a content of cellulosic fiber, wherein the fabric is first impregnated with substantially anhydrous liquid ammonia and is then heated to terminate the ammonia reactions and to evaporate and drive off from the fabric a substantial portion of the ammonia, an improved method of reducing the residual ammonia content of the treated fabric, which comprises

(a) bringing at least one surface of the fabric into momentary contact with a very thin film of water and thereby imparting to said fabric surface a limited moisture content insufficient to wet the fabric completely through, and

(b) thereafter heating said fabric sufficiently to cause said moisture to vaporize and penetrate said fabric, whereby to cause said moisture to replace said residual ammonia within said fabric.

5. A continuous process for removing residual ammonia from fabric having a cellulosic content and treated by impregnation with substantially anhydrous liquid ammonia, which comprises



(a) exposing the fabric to dry heat for a time sufficient to drive off at least about 90% of the ammonia,

(b) thereafter moistening at least one surface of the fabric with an amount of water insufficient to wet the fabric completely through,

(c) thereafter heating the fabric to cause said fabric to be thoroughly penetrated by moisture from said water, and

(d) thereafter heating said fabric to substantially eliminate residual ammonia and excess moisture.

4,099,912

DETERGENT COMPOSITIONS AND WASHING METHODS INCLUDING AND UTILIZING SEPARATE TABLETS OF COMPONENTS

Robert L. Ehrlich, Wyckoff, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 470,258, May 15, 1974, abandoned. This application Sep. 13, 1976, Ser. No. 722,988

Int. Cl.[2] B08B *3/00*

U.S. Cl. 8—137 **8 Claims**

1. A method of washing laundry which consists essentially of admixing with laundry and wash water at a washing temperature in the tub of a washing machine, the volume of which tub is from 20 to 80 liters, a plurality of separate units of different detergent composition components, in the range of 1 to 10 of each of said units, to produce a liquid washing medium containing 0.05% to 0.5% of an operator formulated synthetic organic detergent composition and agitating the medium for a time sufficient to remove soil from the laundry being washed, said units being of tablet, envelope, packet, capsule or other container form having a weight of 5 to 30 grams each and a volume of 4 to 20 milliliters and being dispensed from a dispensing article located on or near the washing machine, which separately stores and dispenses the units as selected by the operator of the washing machine to produce an efficient washing composition for the type of laundry being washed.

4,099,913

FOAMS FOR TREATING FABRICS

Andrew Tainter Walter; George Macon Bryant, both of Charleston, and Ronald Louis Readshaw, South Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

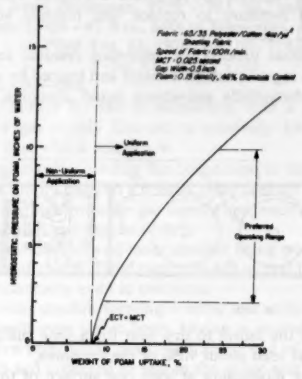
Filed Mar. 25, 1976, Ser. No. 670,380

Int. Cl.[2] D06B *1/04;* D06P *1/16*

U.S. Cl. 8—173 **5 Claims**

1. A froth composition for continuously and directly surface treating a fabric or paper substrate, said composition being a froth having a foam density of from 0.005 to 0.3 gram per cc, an average foam bubble size of from 0.05 to 0.5 millimeters in diameter and a foam half-life of from 1 to 60 minutes, said foam composition comprising from 5 to 75 weight percent of func-

tional textile treating compound, from 0.2 to 5 weight percent of frothing agent, from 0 to 5 weight percent of wetting agent, with the balance of said composition being water, said percent-



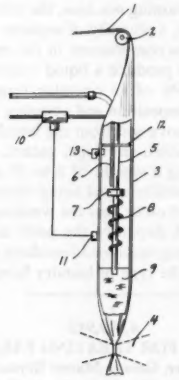
ages based on the weight of said foam composition; said foam further characterized in that it immediately breaks on contact with said substrate and is rapidly absorbed thereby to leave the surface thereof essentially dry to the touch.

4,099,914

METHOD AND AN ARRANGEMENT FOR THE STERILIZATION OF PACKING MATERIAL

Åke Gustafsson, Chatel-Saint-Denis, Switzerland, and Olof Stark, Rydsgård, Sweden, assignors to AB Ziristor, Lund, Sweden

Filed Nov. 24, 1976, Ser. No. 744,604
Claims priority, application Sweden, Nov. 28, 1975, 7513420
Int. Cl.[2] A61L *1/00, 13/00;* **B65B** *31/02, 55/10*
U.S. Cl. 21—57 **9 Claims**



1. A method for the internal sterilization and filling of a tube of packing material comprising the sequential steps of: supplying a tube of packing material to a packaging machine, supplying a sterile product into the tube of material, supplying a liquid sterilizing agent into the tube of material above the sterile product, vaporizing the liquid sterilizing agent, condensing the vaporized liquid sterilizing agent on the inside walls of the tube of material and repeatedly flat pressing and sealing the tube of material to form packages of sterile product.

4,099,915

METHOD FOR RETARDING THE EVAPORATION OF WATER

Robert E. Savoit, Wappingers Falls, and Clemence J. Henry, Newburgh, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,395
Int. Cl.[2] B01J *1/18;* **C10M** *1/28, 3/22;* **C09K** *3/00*
U.S. Cl. 21—60.5 A **4 Claims**

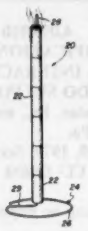
1. A method for suppressing and/or retarding the evaporation of water caused by the movement of partially air-exposed, water-immersed rotary surfaces at a temperature in the range of 50° to 150° F comprising contacting said water with a composition comprising from 99.5 to 99.9 weight percent of a light lubricating oil having a viscosity at 100° F of between 80 and 120 SUS; 0.1 to 0.5 weight percent of an alkaline earth metal sulfonate having two alkyl groups of from 6 to 16 carbon atoms attached to an aromatic group in a symmetrical manner, and 30 to 150 parts per million of an acrylic defoaming agent, whereby said surfaces are preferentially oil wetted; water is stripped therefrom and airwater interfaces are eliminated.

4,099,916

INCENSE PRODUCT

Helen J. Gardner, and Samuel M. Gardner, both of Wheaton, Ill., assignors to Hindu Incense, Chicago, Ill.

Filed Dec. 2, 1976, Ser. No. 746,696
Int. Cl.[2] A61L *9/00, 9/01*
U.S. Cl. 21—116 **9 Claims**



1. An incense product comprising a plurality of incense beads, each of said incense beads being a solid body with a hole therethrough, and a stand including a rod and a base integrally formed of a single length of wire, said rod being adapted to pass through a selected number of said beads, the size of the hole of each bead being greater than the cross sectional size of said rod so that beads may be readily slipped onto said rod.

4,099,917

PROCESS FOR PREPARING A CELL SUSPENSION FROM BLOOD FOR DISCRIMINATION OF WHITE BLOOD CELLS AND PLATELETS FROM OTHER BLOOD PARTICLES

Young Ran Kim, Hartsdale, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,595
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B **11 Claims**

1. A process for preparing a cell suspension from a diluted blood sample for discrimination of white blood cells and platelets from other blood particles which comprises the steps of:

(a) treating an anticoagulated blood sample with a detergent which preconditions the red blood cells for subsequent lysing without damaging the white cell morphology;

(b) adding a fixative thereto with mixing while maintaining the mixture at a neutral pH; and

(c) incubating at a temperature substantially from 55° C to 62° C for at least 2 minutes.

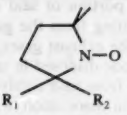
4,099,918

PROXYL NITROXIDES AS SPIN LABELS

John F. W. Keana, Eugene, Oreg., assignor to State Board of Higher Education For and on Behalf of the University of Oregon

Filed Apr. 18, 1977, Ser. No. 788,621
Int. Cl.[2] G01N 27/78; C07D 207/46
U.S. Cl. 23—230 R 2 Claims

1. In the spectrometric analysis of biological molecules, the method comprising labeling the molecule with a 2,2,5,5-tetraalkylpyrrolidine-N-oxyl nitroxide having the formula:



wherein R_1 and R_2 are alkyl, aliphatic, or aromatic groups, saturated or unsaturated, and the carbon atoms in R_1 and R_2, together with the carbon atom in the pyrrolidine-N-oxyl ring to which R_1 and R_2 are attached, form a carbon-to-carbon open chain of from four to fifty carbon atoms, and

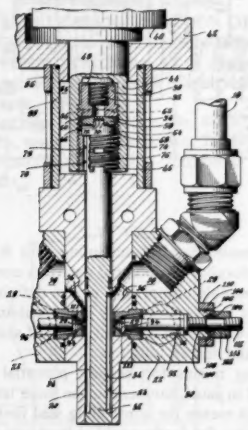
observing the ESR signal of the labeled molecule.

4,099,919

STEM ADJUSTMENT SEAL FOR REACTION INJECTION MOLDING MACHINE

Shirley Margaret Leidal, Akron, Ohio, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 22, 1976, Ser. No. 753,464
Int. Cl.[2] B01F 15/02; B01J 1/00
U.S. Cl. 23—252 R 3 Claims



1. In a mixing head, for a reaction injection molding machine, that includes a body defining a mixing chamber and a plurality of nozzle orifices opening into the mixing chamber for directing reactive polyer components into the mixing chamber, the body being formed with a plurality of at least partially, internally threaded bores terminating at one end in a nozzle orifice and at the other end in an annular rabbet; and adjustable restrictor valve for controlling the amount of component entering the mixing chamber through each one of said nozzle orifices; each restrictor valve comprising:

A. a valve seat formed about the upstream end of the associated nozzle orifice in the bore;

B. an elongated, externally threaded valve member, mounted in said bore for reciprocal movement through screw-like adjustment toward and away from said valve seat, formed with an annular recess intermediate its end positioned adjacent the annular rabbet to, together therewith, define a toroidal channel;

C. a packing gland seal positioned in said toroidal channel;

D. gland seal retaining means for holding said packing gland seal in position in said toroidal channel, said retaining means comprising a removable cap having an aperture for receiving said valve member and a flange formed adjacent said aperture to enclose said toroidal channel; and

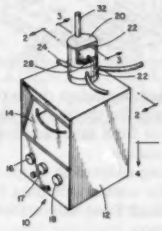
E. lock means comprising a lock nut threaded on said valve member to abut said cap, react thereagainst, and thereby lock said valve member in position once adjusted relative to said valve seat.

4,099,920

TEMPERATURE CONTROL AND STIRRING APPARATUS FOR LUMINESCENCE MEASURING PHOTOMETER

Louis Robert Heiss, Annapolis, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 17, 1977, Ser. No. 778,663
Int. Cl.[2] G01N 21/24
U.S. Cl. 23—253 R 10 Claims



1. In a photometer device which is particularly adapted for sensing the luminescence emitted when a reagent is inserted in a solution containing adenosine triphosphate (ATP) and which includes a reaction chamber mounted on top of a cabinet which has electronic circuitry therein and an indicating meter and control knobs on one side thereof, a photomultiplier tube extending upwardly into the center of the reaction chamber, an opening in the top of the reaction chamber, a rotatable sample tube carrier having a portion thereof received within the reaction chamber and a portion thereof positioned outside of the reaction chamber, the portion outside the reaction chamber having a sample tube receiving opening therein, an arm extending from the carrier for rotating the carrier with a sample tube therein into said reaction chamber to a position beneath the opening in the top thereof for receiving a reagent, and the carrier having a light transmitting passageway in the body thereof between the sample tube and the photomultiplier tube, the improvement comprising means coupled to and rotatable with the carrier for maintaining the liquid contents of the sample tube at a desired temperature and means situated exterior of the sample tube for mechanically mixing and stirring the liquid contents of the sample tube after the tube is rotated to a desired position within the reaction chamber.

4,099,921

CHEMICAL ANALYZER

Robert William Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

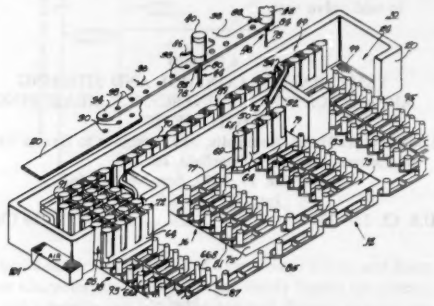
Filed Mar. 28, 1977, Ser. No. 781,765
Int. Cl.[2] G01N 33/16, 1/14
U.S. Cl. 23—253 R 18 Claims

1. A chemical analyzer comprising:

a plurality of movable shuttles which move through a closed path;

a first chamber having first and second opposite ends;

a second chamber parallel to and spaced from said first chamber and having first and second opposite ends;
a first transfer passageway connecting said first ends of said first and second chambers;
a second transfer passageway parallel to and spaced from said first transfer passageway and connecting said second ends of said first and second chambers;
drive means for driving certain of said shuttles in step-by-step motion in said transfer passageways;
said shuttles having camming means on one end for camming other shuttles in a forward direction in said chambers and connecting means on an opposite end for pulling an adjacent shuttle through a distance in said transfer passageways or from said chambers;
a fluid transfer station;
said shuttles being adapted to support receptacles;
said fluid transfer station including fluid transfer means for transferring fluid from said station into said receptacle; and
at least a portion of said closed path being of sufficient length to permit a chemical reaction to take place between two successive appearances of a given receptacle at the station.

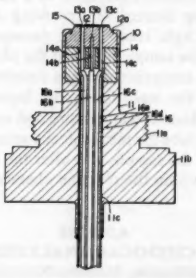


4,099,922

GAS COMPONENT DETECTION APPARATUS

Eturo Yasuda; Susumu Sato; Yoshihiro Segawa; Tadashi Hattori, all of Okazaki, and Keiji Aoki, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 17, 1976, Ser. No. 751,956
Claims priority, application Japan, Dec. 23, 1975, 50-154334
Int. Cl.[2] G01N *27/16*
U.S. Cl. 23—254 E **9 Claims**



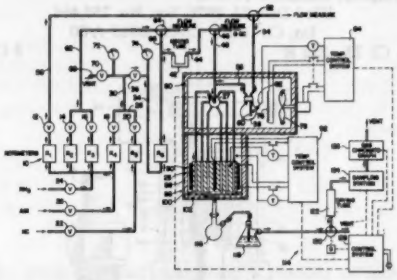
1. A gas component detection apparatus for detecting gaseous components of exhaust gases from an internal combustion engine and determining whether an air-fuel ratio of an air-fuel mixture supplied thereinto is larger or smaller than the stoichiometrical air-fuel ratio comprising:
a gas component detecting element comprising a sintered mass of semiconductive metal oxides, said detecting element having a surface partially exposed to exhaust gases and exhibiting variable electric resistances according to gaseous components and temperatures of the exhaust gases;
a catalyst carried on that surface of said detecting element partially exposed to the exhaust gases for promoting oxidation reactions of the gaseous components of the exhaust gases;
a pair of electrodes inserted into said detecting element in a manner not short-circuited through said catalyst and having outer ends disposed adjacent said catalyst, said electrodes sensing an abrupt change in electric resistances exhibited at that portion of said detecting element near said catalyst resulting from the gaseous components and temperatures of the exhaust gases; and
an additional electrode disposed in said detecting element in a relation spaced from said catalyst, said additional electrode detecting, in association with one of said pair of electrodes, a change in electric resistances resulting mainly from the temperatures of the exhaust gases exhibited at that portion of said detecting element substantially spaced from said catalyst.

4,099,923

AUTOMATIC CATALYTIC SCREENING UNIT

Ernest C. Milberger, Solon, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 17, 1977, Ser. No. 760,198
Int. Cl.[2] G01N *31/08, 31/10*
U.S. Cl. 23—254 R **20 Claims**



1. A automatic catalyst screening unit for automatically screening a plurality of potential catalysts comprising:
a reactor module comprising means defining a plurality of chambers having essentially equal volumes for receiving respective potential catalysts, each of said chambers having an inlet and an outlet;
first heating means for heating potential catalysts when received in said chambers to the same temperature;
first control means for controlling said first heating means;
feeding means for feeding said at least one gaseous reactant to said plurality of chambers;
selector valve means intermediate said feeding means and said plurality of chambers for selectively placing only one of said chambers in fluid communication with said feeding means at any one time;
analyzing means for analyzing the product passing out of said plurality of chambers;
means defining a common manifold attached to the outlets of said plurality of chambers so that each of said chambers is in constant fluid communication with said manifold; and
second control means for controlling said first control means, said selector valve means and said analyzing means so that (1) said at least one gaseous reactant is sequentially fed to said plurality of chambers in a predetermined sequence at at least one predetermined temperature and (2) gross product passing out of each of said chambers is fed

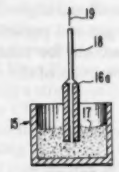
to said analyzing means via said common manifold means and analyzed for useful product.

4,099,924

APPARATUS IMPROVEMENTS FOR GROWING SINGLE CRYSTALLINE SILICON SHEETS

Samuel Berkman, Florham Park; Michel Thomas Duffy, Princeton Junction; Kyong-Min Kim, East Windsor, and Glenn Wherry Cullen, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,105
Int. Cl.[2] C01B *35/00;* B01J *17/18*
U.S. Cl. 23—273 SP 5 Claims



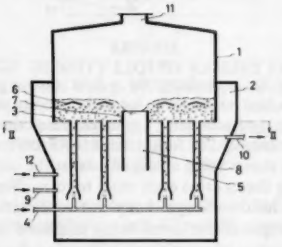
1. In an apparatus for growing single crystalline silicon in sheet or ribbon form comprising a crucible and die in contact with molten silicon the improvement which comprises a protective layer of silicon oxynitride of the general formula $Si-O_{(3/2)(x)}N_{(4/3)-(x)}$, wherein x is equal to or greater than 0.1 but equal or less than 0.8, applied by chemical vapor deposition on the portions of said crucible and die in contact with said molten silicon.

4,099,925

APPARATUS FOR DESULFURIZATION OF FLUE GAS

Hiroshi Yanagioka, Yokohama; Shinichi Shimizu, Kawasaki, and Kouichi Tamura, Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Sep. 20, 1977, Ser. No. 834,878
Claims priority, application Japan, Sep. 29, 1976, 51-115981
Int. Cl.[2] B01J *1/22;* C01B *17/00;* B01D *53/14*
U.S. Cl. 23—285 4 Claims



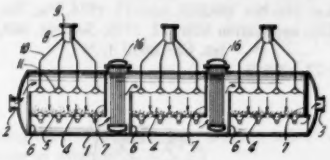
1. An apparatus for desulfurization of flue gas, in which a sulfurous acid gas-containing flue gas is contacted with an absorption liquid to have the sulfurous acid gas absorbed by said absorption liquid and simultaneously oxidized by an oxygen-containing gas and fixed by a fixing reactant in the absorption liquid, which comprises: (a) a single vessel divided by a flue gas-dispersing plate and a weir into an upper flue gas-absorption liquid contacting zone and a lower absorption liquid reservoir zone; (b) a liquid-dropping zone formed by a lower portion of the weir extended to the absorption liquid reservoir zone, wherein the absorption liquid overflows from the contacting zone and drops; (c) a flue gas-introducing section provided along the peripheral wall of the absorption liquid reservoir zone and located below the flue gas-dispersing plate; (d) liquid-raising pipes connected between the lower part of the absorption liquid reservoir zone and the flue gas-dispersing plate, oxygen-containing gas introducing pipes with openings below the openings of the lower end of the liquid-raising pipes and in alignment therewith, fixing reactant-introducing means and absorption liquid-discharging means, respectively provided in the absorption liquid reservoir zone; and (e) a treated gas discharging outlet provided above the flue gas-dispersing plate in the flue gas-absorption liquid contacting zone.

4,099,926

MULTISTAGE REACTOR

Friedrich Güthuber, Metten; Adolf Jäger, Plattling, and Heinrich Ufholz, Deggendorf, all of Germany, assignors to Deggendorfer Werft und Eisenbau G.m.b.H., Deggendorf, Germany

Filed Oct. 20, 1975, Ser. No. 624,289
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1974, 2449789
Int. Cl.[2] B01J *4/00, 8/04, 8/10, 8/12*
U.S. Cl. 23—286 12 Claims



4. Multi-stage hurdle-type reactor for catalytic exothermic and endothermic chemical processes comprising a tubular shaped reactor wall with the axis thereof arranged horizontally and forming a reaction space therein, said reactor wall having a first end and a second end spaced apart in the axial direction thereof from said first end, said first and second ends extending transversely of said reactor wall axis and providing closures for the opposite ends of said reactor wall, an inlet in said first end for admitting a reactive gas into said reaction space, an outlet in said second end for discharging the reactive gas after it flows through said reaction space, a plurality of serially arranged catalyser beds mounted within said reaction space and spaced apart in the axial direction thereof, each of said catalyser beds having an upper surface through which the catalyst is fed and a lower surface below the upper surface on which the catalyst is supported and through which the catalyst exits, a plurality of distributor pipes extending downwardly into said reaction space for each of said plurality of catalyser beds, each said distributor pipe having one end in communication with said upper surface of one of said plurality of catalyser beds and another end located above said reactor wall and in communication with a source of catalyser so that the catalyser is fed to each said catalyser bed, a plurality of draining pipes extending downwardly from said reactor wall for each of said plurality of catalyser beds, each said draining pipe having a first end in communication with said lower surface of one of said plurality of catalyser beds and a second end spaced from said first end for the exit of the catalyser from said draining pipe of the one of said plurality of catalyser beds, each of said catalyser beds having a first end and a second end extending transversely of the axis of said reactor and located at the opposite ends of said bed, each of said plurality of catalyser beds comprising an upright first delimiting wall located at the first end of said bed and extending downwardly from said upper surface past said lower surface and being connected to one portion of said reactor wall, an upright second delimiting wall located at the second end of said bed and extending upwardly from said lower surface past said upper surface and being connected to another portion of said reactor wall, said one

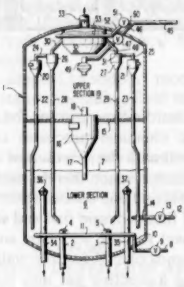
portion and said another portion of said reactor wall being diametrically opposed to one another so that reactive gas entering said reaction space from said inlet is forced to follow a certain path through said catalyser beds in the axial direction of said reactor wall by said first delimiting walls and said second delimiting walls, each of said plurality of catalyser beds being mounted in said reaction space in a horizontal position parallel with said axial direction thereof, said plurality of catalyser beds comprising at least three catalyser beds, a plurality of heat exchangers located in said reaction space, each of said heat exchangers having a nest of tubes, the tubes in each of said plurality of heat exchangers being mounted in a direction transverse to the axial direction of said reactor wall and spaced from one another by one of said plurality of catalyser beds, whereby the reactive gas entering said reaction space passes through a first catalyser bed located closest to said inlet, then through one of said heat exchangers, and then alternately through another catalyser bed and another heat exchanger.

4,099,927

APPARATUS FOR REGENERATION OF CATALYST

Claude O. McKinney, Munster, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 460,518, Apr. 12, 1974, Pat. No. 3,990,992.
This application Mar. 22, 1976, Ser. No. 669,046
Int. Cl.[2] B01J *8/28*
U.S. Cl. 23—288 B **9 Claims**



1. A regeneration vessel for the continuous regeneration of a fluidizable cracking catalyst which has been deactivated with coke deposits while employed in a catalytic hydrocarbon cracking process comprising

a vessel having an upper section and a lower section;

catalyst particle inlet means in said lower section of the vessel for supplying said catalyst which has been deactivated with coke deposits;

regenerated catalyst particle outlet means in said lower section of the vessel for withdrawing regenerated catalyst;

oxygen-containing gas inlet catalyst fluidizing means in a lower portion of said lower section of the vessel for supplying oxygen-containing gas to fluidize catalyst in said lower section of the vessel and to support combustion of coke on the catalyst and produce regeneration gases containing carbon monoxide;

an essentially solid, horizontal partition extending throughout the cross-section of said vessel at the position of the partition, said partition separating said lower section and said upper section of said vessel, and said partition being located at about 25 to 80 percent of the internal height of the vessel so as to provide sufficient space in said lower section for essentially complete combustion of carbon monoxide in the regeneration gases and for regeneration of said catalyst;

gas passage means in gas-flow communication with said lower section and said upper section through said partition, said gas passage means including combusted regeneration gas and catalyst first separating means for receiving said regeneration gases and catalyst from said lower section to separate catalyst particles from the regeneration gases rising from said lower section to said upper section, said combusted regeneration gas and catalyst separating means having discharge means for discharging said separated catalyst particles;

combustion gas and particle cyclone, second separation means in an upper portion of said upper section of the vessel for receiving regeneration gases from said upper section and for separating particles of catalyst from said gases, said combustion gas and particle separation means having discharge means for discharging said separated catalyst particles; and

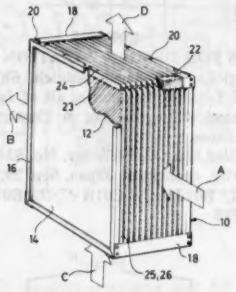
combustion gas effluent means in the upper portion of said upper section of the vessel and in gas-flow communication with said combustion gas and particle second separation means in said upper section for exhausting regeneration gases from said upper section of the regeneration vessel.

4,099,928

METHOD OF MANUFACTURING A HEAT EXCHANGER BODY FOR RECUPERATIVE EXCHANGERS

Per S. Norback, Lidingo, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Jul. 15, 1976, Ser. No. 705,536
Claims priority, application Sweden, Jul. 18, 1975, 7508256
Int. Cl.[2] B21D *53/00*
U.S. Cl. 29—157.3 D **11 Claims**



1. Method for manufacturing a heat exchanger body for recuperative heat exchangers for two gaseous media, which body is of the type containing a number of superimposed sheets which are corrugated to form channels for the media to flow through, the sheets being arranged so that the corrugations in neighbouring sheets cross each other to form channels passing through the heat exchanger body in two directions, and the juxtaposed edges of the sheets being displaced and joined to the corresponding edges of the neighbouring sheets so that the edges on the same side of the body alternately are sealed together and form openings to admit the heat exchange medium to the channels, characterized in that the sheets (**12**) are first corrugated all over and cut to the desired dimensions, and that the edges (**23** –**26**) are then compressed flat in such a manner that opposite ends of the sheet are in the same plane and adjacent ends of the sheet are in different but parallel planes, and at the same time or subsequently the juxtaposed edges (**23** and **24**, or **25** and **26**, respectively) are displaced in the same direction, but in the opposite direction to the other pair of juxtaposed edges (**25** and **26**, or **23** and **24**, respectively), whereafter the desired number of sheets are assembled into the heat exchanger body (**10**) and those displaced edges of neighbouring sheets (**12**) which bear on each other are joined and sealed.

4,099,929

METHOD OF REMOVING ASH COMPONENTS FROM HIGH-ASH CONTENT COALS

Kurt Tippmer, Recklinghausen; Hubert Schmitt, Bochum; Heinrich Vinke, Recklinghausen and Georg Abendroth, Dülmen, all of Germany, assignors to Firma Carl Still Recklinghausen, Germany

Filed Mar. 11, 1977, Ser. No. 776,870

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611619

Int. Cl.[2] C10L *9/00*; C10J *3/00*

U.S. Cl. 44—1 F **15 Claims**

12. A method of removing ash components from coals, particularly, high-ash content coals comprising grinding the coal into ground particles, suspending the ground coal in an aqueous carbonate solution to form a coal liquor suspension, maintaining said coal liquor suspension in a reactor from 45 to 120 minutes at a temperature in the range from 250° to 280° C under a pressure of 50 to 80 atm causing CO_2 to be set free by dissociation, directing a stream of inert gas through the reactor to mix with the free CO_2 whereby the CO_2 is discharged from the reactor with said inert gas stream, cooling the coal liquor suspension, separating acqueous liquor of said coal liquor suspension from the coal therein whereby said separated aqueous liquor contains dissolved ash components, directing said separated aqueous liquor with dissolved ash component to a spray tower whereby said separated aqueous liquor is exposed to gases containing CO_2 at elevated temperature and pressures to carbonize said liquor, separating the insoluble ash components from the soluble alkali carbonates of said carbonized liquor, and recycling the carbonized liquor to said reactor to form a coal liquor suspension on said reactor.

4,099,930

CATALYTIC FUEL ADDITIVE FOR GASOLINE AND DIESEL ENGINES

Harry Matthew Webb, Toronto, Canada, assignor to Natural Resources Guardianship International, Inc., Clayville, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,777

Int. Cl.[2] C10L *1/24*

U.S. Cl. 44—56 **10 Claims**

1. A fuel additive for internal combustion and diesel engines consisting of an active ingredient formulation comprising a mixture of picric acid and ferrous sulfate in a relationship of picric acid:ferrous sulfate of about 17:1 to 70:1 in a mixed solvent of lower alcohol, toluene, and water.

4,099,931

HIGH DENSITY LIQUID RAMJET FUEL

James T. Bryant, and George W. Burdette, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1972, Ser. No. 294,068

Int. Cl.[2] C10L *1/04*

U.S. Cl. 44—80 **3 Claims**

1. A fuel mixture consisting essentially of 95.2 weight percent decahydronaphthalene and 4.8 weight percent n-hexane.

4,099,932

CONVERSION OF SOLID FUELS TO FLUID FUELS

Edward T. Child, Tarrytown, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,154

Int. Cl.[2] C10J *3/00, 3/16*

U.S. Cl. 48—197 R **10 Claims**

1. A continuous process for the production of synthesis gas which comprises the steps of

a. mixing finely divided solid carbonaceous fuel with a solvent therefor,

b. heating the resulting mixture to a temperature between about 700° and 900° F. in a solvation zone to solubilize said solid fuel,

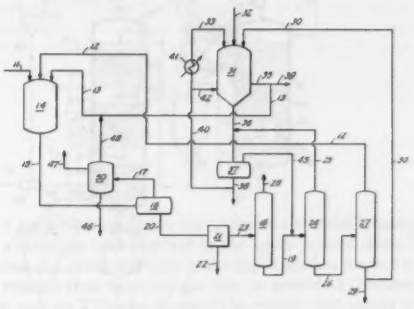
c. removing the heated mixture of solvent and solubilized fuel from the solvation zone,

d. separating unsolubilized mineral residue from the liquid portion of the solvation zone effluent,

e. adding to said liquid portion a suspension of particulate carbon in a hydrocarbon liquid

f. distilling the mixture formed in step (e) to remove liquids boiling up to about 450° F.

g. separating the still residue from step (f) into a fraction boiling up to about 900° F. and a residual fraction containing particulate carbon boiling above about 900° F.



h. returning the fraction boiling up to about 900° F. to solvation zone as solvent

i. combining the mineral residue of step (d) with the residual fraction of step (g)

j. subjecting the mixture from step (i) to partial combustion to form a gas comprising hydrogen and carbon monoxide and containing particulate carbon

k. transferring the particulate carbon of step (j) to suspension in the liquids boiling up to about 450° F. of step (f) and

l. adding the suspension of step (k) to the liquid portion of the solvation zone effluent as in step (e).

4,099,933

PROCESS FOR THE MULTIPLE ZONE GASIFICATION OF COAL

Clarence A. Johnson, Princeton, N.J., and John Shen, Gaithersburg, Md., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Continuation-in-part of Ser. No. 365,910, Jun. 1, 1973, abandoned. This application Jun. 10, 1975, Ser. No. 585,696

Int. Cl.[2] C10J *3/54*

U.S. Cl. 48—202 **10 Claims**

1. A process for gasifying particulate coal in a vertical multibed reactor comprising an upper bed, at least one (1) intermediate bed, and a lower gasifying bed, wherein the temperature profile of the reactor increases from the upper bed to the lower bed, and wherein an inventory of particulate coal is maintained in each bed, the coal being sequentially passed to each successively lower bed, comprising the steps of:

(a) passing particulate coal to the upper bed of the gasifier, the gasifier being maintained at a pressure between about 400 and 1500 psig;

(b) passing a fluidizing gas comprising oxygen and steam upwardly through each bed of the gasifier at sufficient velocity to fluidize and heat each bed;

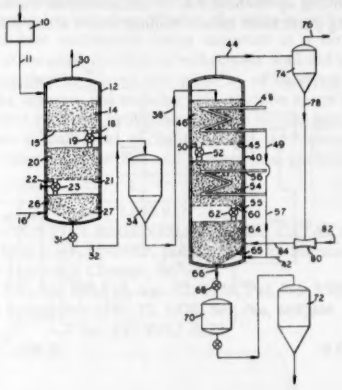
(c) maintaining a heating rate of the coal in each bed of the gasifier at a rate between about 20° and 100° F per minute, whereby swelling and thermal disintegration of the particulate coal is minimized,

(d) maintaining the coal inventory in the uppermost bed of the gasifier at a temperature between about 600° and 800° F;

(e) transferring the coal from the upper bed to the next lower

intermediate bed of the gasifier intermittently in batches, wherein the coal is heated to a temperature between 1000° and 1400° F thereby partially devolitilzing the coal, liberating tars and oils therefrom;

(f) condensing the tars carried by the upwardly flowing fluidizing gases on the particulate coal inventory maintained in the upper bed of the gasifier, whereby the tars and oils are substantially hydrocracked upon sequential passage to the intermediate bed;



(g) passing the partially devolitized coal to the lowest bed of the gasifier wherein the coal is heated to a temperature between about 1600° and 1800° F, such temperature not exceeding the ash softening point of the coal, whereby the coal reacts with the fluidizing gas thereby converting the coal into char, byproduct ash and a gaseous product;

(h) removing a portion of the char and byproduct ash from the lowest bed of the gasifier;

(i) removing a gaseous product stream from the upper bed of the gasifier.

4,099,934

METHOD FOR MANUFACTURING RESINOID-BONDED GRINDING TOOLS

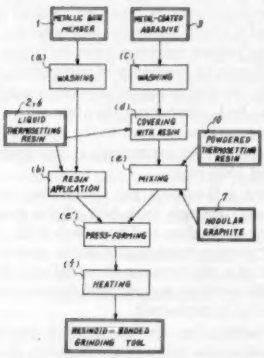
Ikuo Suzuki, Chiryu; Tomoyasu Imai, Kariya; Masato Kitajima, Hekinan, and Kazunori Hota, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi, Japan

Filed Dec. 14, 1976, Ser. No. 750,439

Claims priority, application Japan, Sep. 1, 1976, 51-104395; Jul. 29, 1976, 51-90611

Int. Cl.[2] C23G *1/02, 1/14*

U.S. Cl. 51—295 **11 Claims**



1. A method for manufacturing a resinoid-bonded grinding tool in which metal-coated abrasive grains are adhesively attached upon the surface of a metallic base member with a thermosetting resin, comprising the steps of:

(a) washing said surface of said base member so as to expose a pure metallic surface thereon by washing said surface of said metallic base member with a grease removing solvent; washing said washed surface with an alkali solution; and then washing said alkali washed surface with an acid solution;

(b) applying a liquid thermosetting resin to said pure metallic surface of said base member so as to prevent the formation of an oxide film thereon or the adherence of gas thereto during subsequent heating;

(c) washing said abrasive grains;

(d) coating the surface of said abrasive grains with a liquid thermosetting resin;

(e) mixing a powdered thermosetting resin with said abrasive grains covered with said liquid thermosetting resin and press-forming the mixture upon said resin-applied surface of said base member to form a press-formed article of a desired shape; and

(f) heating said press-formed article formed upon said base member so as to thermally set said formed article upon said base member.

4,099,935

CUTTING TEETH FOR ETCHED ABRASIVES

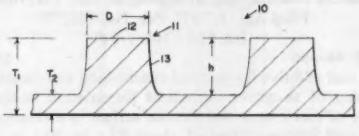
Herbert M. Bond, Stillwater, and Michael E. Rucinski, St. Paul, both of Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

Continuation of Ser. No. 627,751, Oct. 31, 1975, abandoned, and a continuation of Ser. No. 489,247, Jul. 17, 1974, abandoned.

This application Jan. 31, 1977, Ser. No. 764,501

Int. Cl.[2] B24D *3/06*

U.S. Cl. 51—309 R **1 Claim**



1. A one piece abrading device for smoothly abrading away material, said abrading device comprising a flexible base member having rigid abrading teeth thereon, said base member and said abrading teeth comprised of the same metallic base material, said base member defined by a width, a thickness and a length; said thickness of said abrading member being substantially of less dimension than said width and said length so that said base member lacks rigidity and flexes in response to a force on the surface of said base member, said abrading teeth comprising a plurality of metallic post-shaped cutting teeth spaced widthwise and lengthwise across said base member, said abrading teeth having a rigid top cutting surface, said teeth characterized by being distributed throughout said base member to thereby provide said abrading device with tooth density of approximately 700 to 900 teeth per square inch so as to smoothly shear away material on the surface of an article to be abraded when said abrading device is rubbed over the article to be abraded, said cutting teeth integrally formed with said base member and projecting a distance H from said base member, said plurality of postshaped cutting teeth having a substantially flat top and substantially vertical side walls, said substantially flat top of said plurality of post-shaped cutting teeth having a diameter designated by D, said diameter of said teeth having a minimum dimension of about 0.0015 inches to prevent said teeth from piercing the surface of the article to be abraded with said dimension H of said teeth having a minimum dimension of about 0.0025 inches to thereby produce abrading teeth which are sufficiently rigid to smoothly abrade away material.

4,099,936

PROCESS FOR THE PURIFICATION OF SILANE

Gregorio Tarancon, Woodbridge, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,197
Int. Cl.[2] B01D *53/02*
U.S. Cl. 55—75 6 Claims

1. A process for the purification of a mixture of silane and impurities comprising passing the mixture through a succession of zones connected in series, in a closed system, according to the following steps:

(a) passing the mixture, in gaseous form, through a zone containing porous, granular charcoal as an adsorbent at a temperature in the range of about minus 40° C to about minus 80° C to provide a mixture of silane and remaining impurities in gaseous form;

(b) passing the gaseous mixture from step (a) through a zone containing porous, granular magnesium silicate as an adsorbent at a temperature in the range of about minus 40° C to about 80° C to provide a mixture of silane and remaining impurities in gaseous form;

(c) passing the gaseous mixture from step (b) into a distillation zone in such a manner that the impurities are removed overhead in gaseous form and at least about 95 percent by weight of the silane is converted to liquid bottoms; and

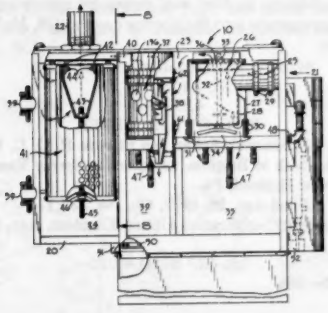
(d) recovering the silane.

4,099,937

AUTOMATIC DUMPING ROOF DRILL DUST COLLECTOR

Gregory Allen Ufken, and Jon Arthur Ruopsa, both of Minneapolis, Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Nov. 19, 1976, Ser. No. 743,226
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—212 12 Claims



1. A roof dust collector comprising:

(a) a housing having an inlet for dust laden air to enter therein, and an outlet for cleaned air to exit therefrom,

(b) dust separating means, including at least one cyclone dust separator, within the housing between the inlet and the outlet, said housing having walls forming at least one dust collection chamber in said housing below said dust separating means;

(c) means within the housing for washing down the walls of the dust collection chamber;

(d) means including a hinged door in said housing, for emptying the collected dust from said chamber; and

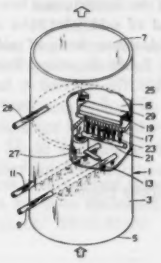
(e) means, including a limit switch removed from the housing, for actuating said washing and emptying means, and for controlling a cyclic sequence of actuation so that the washing means are only actuated as the collection chamber is being emptied.

4,099,938

MIST ELIMINATOR CLEANING DEVICE

James H. Onnen, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Feb. 17, 1977, Ser. No. 769,521
Int. Cl.[2] B01D *47/06*
U.S. Cl. 55—230 12 Claims



1. In a gas scrubbing device that includes a vertical housing having a dirty gas inlet disposed in the lower portion thereof and a clean gas outlet disposed in the upper portion thereof in spaced relation from the dirty gas inlet to provide a confined gas flow path for a gaseous stream to be treated, and, means to introduce scrubbing solution within the confined gas flow path and means to remove the scrubbing solution from the housing; the improvement comprising:

a mist eliminator disposed within the confined gas flow path through which substantially all of the upwardly flowing gases pass, the mist eliminator being spaced vertically above the means to introduce scrubbing solution;

two revolvably mounted spray headers in flow communication with a spraying solution source, one of the headers being disposed above the mist eliminator with means to spray a solution onto the downstream side of the mist eliminator, the other of the headers being disposed beneath the mist eliminator with means to spray a solution onto the upstream side of the mist eliminator; and,

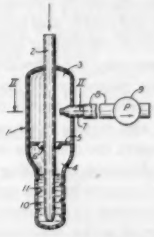
drive means for the spray headers whereby said mist eliminator is cleanable during normal operations.

4,099,939

SPILL-PROOF GAS SAMPLER

Frank J. Vancheri; Stanley P. Nebash, both of Pittsburgh, and Paul W. McConnaughey, Wilkinsburg, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jul. 20, 1977, Ser. No. 817,365
Int. Cl.[2] B01D *47/02*
U.S. Cl. 55—246 4 Claims



1. A spill-proof gas sampler in the form of a bubbler comprising a normally upright bottle having an upper portion and a lower portion, a central inlet tube extending from near the bottom of the bottle up through the top of the bottle, a collar encircling the inlet tube in the lower part of said upper portion

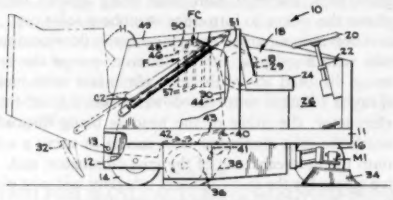
and sealed to the side of the bottle to divide it into upper and lower chambers, there being clearance between the collar and inlet tube to provide a restricted passage between said chambers, an exhaust tube above said collar extending from near one side of said inlet tube laterally out through the side of the bottle, said tubes being sealed in the bottle, and a predetermined volume of liquid in said lower chamber spaced from said collar, the depth of the liquid in said lower chamber being such that the lower end of said inlet tube is located beneath the surface of the liquid, the capacity of said lower chamber being such that all of the liquid remaining therein when the bottle is on its side is beneath the inlet tube, and the capacity of the upper chamber is such that when the bottle is inverted all of the liquid in that chamber will be below the exhaust tube and when the bottle is turned back on its side from its inverted position the inner end of the exhaust tube will always be above the liquid in said upper chamber.

4,099,940

IMPULSE FILTER CLEANER

Donald G. Mortensen, San Jose, and Dennis P. Strand, Modesto, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Mar. 17, 1977, Ser. No. 778,633
Int. Cl.[2] B01D *41/04*
U.S. Cl. 55—300 **10 Claims**



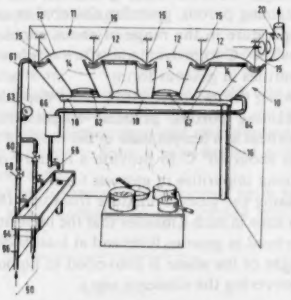
1. In an apparatus for cleaning dust filters comprising frame structure, a filter support, means for resiliently mounting said support on said frame structure, dust filters depending from said support, said cleaning apparatus comprising a rocker arm, means for pivotally supporting said rocker arm on said frame structure, a hammer head mounted on said rocker arm in spaced relation to said pivot means and means for operating said rocker arm to cause said hammer head to strike the filter support; the improvement wherein said operating means comprises resilient crank arm means having one end portion operatively connected to said rocker arm pivot means for oscillating the arm about its pivot, oscillating means having a predetermined stroke and engaging the other end portion of said resilient crank arm means, means for driving said oscillating means, the stroke of said oscillating means in one direction acting on said resilient crank arm means, to cause said hammer head to strike said filter support, the complete stroke of said oscillating means in said one direction exceeding the stroke motion required to cause the hammer head to strike the support so that the striking force imparted by said oscillating means continues right up to the time of strike, said resilient crank arm means deflecting during the terminal portion of said complete stroke thereby accommodating completion of the stroke while motion of said hammer head remains interrupted by said filter support, and said oscillating means further including means for retracting said hammer head from said support during the stroke of said oscillating means in the opposite direction.

4,099,941

CONDENSER CEILING FOR KITCHENS

Paul Gutermuth, Augustastrasse 48, D-6456 Langenselbold; Heinrich Oetjen, August-Bebel-Strasse, 11, D-6451 Bruchkobel, and Paul Gutermuth, Jr., Augustastrasse 48, D-6456 Langenselbold, all of Fed. Rep. of Germany

Filed Sep. 16, 1977, Ser. No. 834,022
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641708
Int. Cl.[2] B01D *51/00*
U.S. Cl. 55—269 **6 Claims**



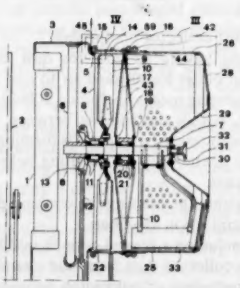
1. In a subceiling for protecting damp rooms, such as industrial canteens, slaughter houses, laundries and the like, against rising steam vapors and the precipitation of particles contained therein, and including at least one overhead exhaust port, and a plurality of upwardly arched ceiling elements whose lateral edges are disposed approximate the openings of U-shaped collecting channels and spaced from the opposite walls of the collecting channels, the collecting channels being connected with a condensate absorber, the improvements characterized by: the collecting channels (**14**, **22**, **30**, **70**) being configured as groovelike hollow profiles, and means for supplying fluid at desired temperatures into the interior cavities (**28**, **35**, **37**, **77**) of the profiles.

4,099,942

ROTARY AIR FILTER

José A. C. L. Carnewal, Eeklo, and Etienne R. O. C. Hommez, Oostende, both of Belgium, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 20, 1977, Ser. No. 789,174
Claims priority, application United Kingdom, Apr. 27, 1976, 16973/76
Int. Cl.[2] B01D *46/26*
U.S. Cl. 55—396 **4 Claims**



1. A rotary air filter assembly comprising,

(a) a stationary structure having collar means defining a generally circular opening,

(b) support means secured to the stationary structure generally centrally thereof,

(c) fan means with opposed intake and pressure sides, rotatably mounted on the support means and adjacent the generally circular opening with the generally circular opening being located on the pressure side of the fan means, said fan means having a diameter substantially corresponding to the diameter of the generally circular opening,

(d) an annular structure rotatably mounted on the support means and generally surrounding the fan means, said annular structure having opposed ends, one of which is disposed adjacent said collar means defining therewith an annular opening at the pressure side of said fan means,

(e) perforated filter means mounted detachably and for rotation in unison with the annular structure at the intake side of said fan means, said filter means having an end portion remote from said fan means and an opposite generally circular edge in registration with the end of said annular structure opposite to the collar means, said filter means and said annular structure having a generally unobstructed inner surface lengthwise thereof in the direction from the end portion of said filter means to said annular opening for enabling unobstructed generally linear movement of material along the inner surface towards and through said annular opening,

(f) first drive means for driving said annular structure and said filter means in unison, and

(g) second drive means for driving said fan means for drawing air through said filter means, for forcing filtered air through said circular opening in said collar means and for producing an overpressure at the annular opening thereby preventing atmospheric air from penetrating said annular opening during operation.

4,099,943

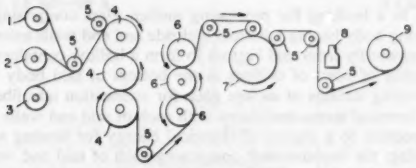
COMPOSITE FLUID FILTERING MEDIUM AND METHOD OF MAKING

Kurt Fischman, New Milford, N.J.; Robert Offer, Racine, Wis.; Bernard Rudner, Ridgewood, N.J., and David Shepard, Racine, Wis., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Oct. 18, 1976, Ser. No. 733,290

Int. Cl.[2] B01D *39/16*

U.S. Cl. 55—487 **12 Claims**



1. A fluid-permeable article of manufacture suitable for use in the removal of solid particles from a fluid by filtration, said article consisting of a layer of open cell polyurethane foam adhered by adhesive means to a layer of non-woven fibrous material of fine porosity relative to the porosity of the foam, said foam being impregnated with an impingement fluid, and said adhesive means being a permeable layer of a thermoplastic hot-melt adhesive.

10. A method for the manufacture of an article suitable for use in the removal of solid particles from a fluid by filtration which comprises subjecting a sandwich consisting of an outer layer of open cell polyurethane foam, an outer layer of non-woven fibrous material of fine porosity relative to the porosity of the foam and an intermediate permeable layer of thermoplastic hot-melt adhesive to the action of heat and pressure whereby the adhesive is melted, following which the sandwich is cooled to solidify the adhesive, whereby the adhesive adheres the foam to the fibrous material, and following which the foam layer is impregnated with an impingement fluid.

4,099,944

FILTERS

Maurice Davis, Croydon, England, assignor to Davis Industrial (Equipment) Limited, Croydon, England

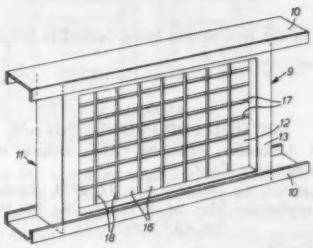
Continuation-in-part of Ser. No. 272,023, Jul. 14, 1972, abandoned. This application Aug. 7, 1974, Ser. No. 495,413

Claims priority, application United Kingdom, Jul. 14, 1971, 32968; Australia, Jul. 27, 1972, 45052; France, Jul. 17, 1972, 25728; Canada, Nov. 21, 1973, 186424

The portion of the term of this patent subsequent to Apr. 11, 1994, has been disclaimed.

Int. Cl.[2] B01D *46/10*

U.S. Cl. 55—501 **11 Claims**



1. A disassemblable filter assembly comprising a filter unit and a sealing member extending around the periphery of the filter unit, the periphery of said filter unit being releasably sealingly received in a channel formed around the entire inner periphery of said sealing member by a pair of spaced apart opposed inwardly directed flanges, said filter unit comprising a resilient foamed synthetic plastic filter element, and a perforate filter support member including a grid portion which extends over a first face of said filter element and is provided at its periphery with a turned marginal portion which projects into and makes releasable locking engagement with one of said flanges of said sealing member so as to secure the filter unit to said sealing member.

4,099,945

EFFICIENT AIR FRACTIONATION

Werner Skolaude, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden Germany

Filed Oct. 27, 1976, Ser. No. 736,212

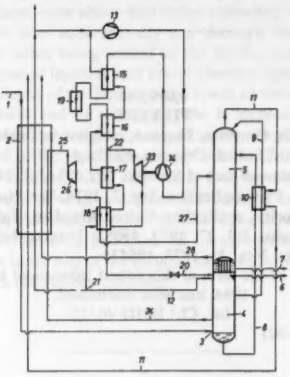
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1975, 2548222

Int. Cl.[2] F25J *3/04*

U.S. Cl. 62—30 **10 Claims**

1. In a process for the fractionation of air wherein the air is subjected to rectification in a high pressure column and a low pressure column, wherein in a liquefaction cycle, a first stream of nitrogen is withdrawn in the gaseous phase from the head of the high-pressure column and is heated, compressed and recooled then liquefied by expansion and recycled as liquid to the high-pressure column and wherein a second gaseous stream containing nitrogen is derived from the high pressure column, is preheated and is then expanded through a low-pressure expansion turbine, the improvement which comprises cooling

the second gaseous stream expanded in the low-pressure expansion turbine in an indirect heat exchange step with at least



a portion of the first stream being heated in the liquefaction cycle.

4,099,946

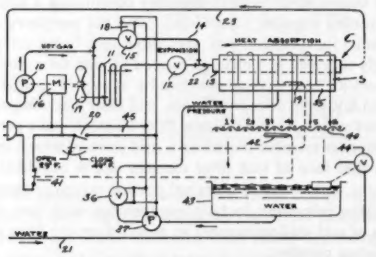
METHOD FOR PRODUCING ICE

Robert W. Alexander, Pasadena, Calif., assignor to Armalite, Inc., Costa Mesa, Calif.

Division of Ser. No. 462,887, Apr. 22, 1974, abandoned. This application Mar. 24, 1975, Ser. No. 561,197

Int. Cl.[2] F25C *5/10*

U.S. Cl. 62—73 **2 Claims**



1. The method of producing multi-form ice and comprising, holding still water in a series of stalls, the progressive application of heat absorption through said series of stalls of still water until all stalls are solidly iced, followed by the progressive application of heat through said series of stalls of solid ice until the ice-to-stall interfaces are thawed, and completed by the application of pressured water beneath said solid ice to refill said stalls by progressively floating and hydraulically ejecting the ice as a product therefrom, and the product cycling repeated by holding said refill water and applying said progressively applied heat absorption in place of said progressive application of heat.

4,099,947

CONCENTRATION OF COMESTIBLE LIQUIDS

Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Patent Corporation, Houston, Tex.

Division of Ser. No. 320,594, Jan. 2, 1973, abandoned. This application Feb. 23, 1977, Ser. No. 771,128

Int. Cl.[2] B01D *9/04*

U.S. Cl. 62—532 **3 Claims**

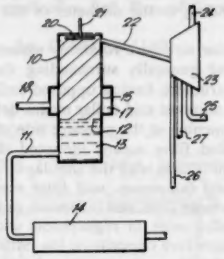
1. Apparatus for concentration of aqueous solutions comprising:

(a) a crystallizer,

(b) a draining tower connected to the crystallizer to receive ice-liquid slurry forced thereto from said crystallizer;

(c) filtering outlet means in said tower for removing filtered liquid from said tower;

(d) a centrifuge, and



(e) means for transferring ice from said tower to said centrifuge,

(f) said connection to said tower of said crystallizer being positioned below said filtering outlet means and said means for transferring being positioned above said filtering outlet means.

4,099,948

BUSHING FOR PROCESSING MOLTEN GLASS

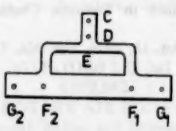
John Stuart Thomas, St. Helena, England, assignor to Fibreglass Limited, St. Helena, England

Continuation of Ser. No. 669,090, Mar. 22, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,257

Claims priority, application United Kingdom, Apr. 2, 1975, 13516/75

Int. Cl.[2] C03B *37/02*

U.S. Cl. 65—1 **5 Claims**



1. In a bushing for processing molten glass comprising a bushing body having a bottom and side and end walls extending upwardly from said bottom to form a hollow container; a plurality of rows of orifices in the bottom of said body for delivering streams of molten glass for attenuation into fibers, and terminal means associated with each of said end walls for connection to a source of electrical energy for heating said bushing; the improvement comprising each of said end walls and its associated terminal means being cast as a single, weld-free, integral unit by a lost wax investment casting process in a vacuum furnace from a material selected from the group consisting of platinum and platinum/rhodium alloy.

4,099,949

METHOD OF REDUCING DETERIORATION OF ELECTRIC FURNACE REFRACTORY METAL COMPONENTS

Leonard Elmo Olds, Castle Rock, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 737,805, Nov. 1, 1976, abandoned. This application Aug. 26, 1977, Ser. No. 827,925

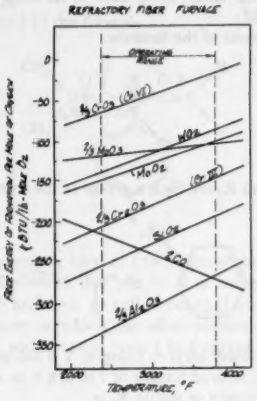
Int. Cl.[2] C03B *5/02*

U.S. Cl. 65—17 **18 Claims**

1. A process for the reduction or prevention of chromia-induced oxidative deterioration of components made of refrac-

tory metal selected from the group consisting of molybdenum, tungsten, rhenium, tantalum, osmium and iridium and alloys thereof in an electric furnace in which a chromia-containing oxide mixture is melted, which process comprises:

supplying to the furnace in addition to the oxide mixture an additive material which is in less than its maximum valence state and which can be oxidized by chromium dioxide or chromium trioxide to an oxide which has a lower



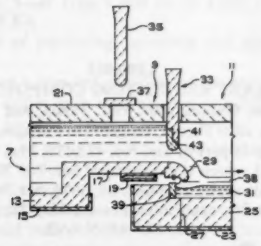
free energy of formation per mole of oxygen than the oxides of the refractory metal and chromia, such that in operation the additive material is oxidized in preference to the oxidation of the refractory metal, acts to reduce the higher chromium oxides to chromia, and forms an oxide which is inert to the refractory metal, the reactive quantity of said additive being present as 25 to 50 percent by weight based on weight of chromia in the mixture.

4,099,950

GLASS RIBBON APPARATUS WITH TWEEL EMPLOYING GLASSY SILICA GLASS CONTACT REFRACTORY

George A. Pecoraro, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 4, 1977, Ser. No. 821,671
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—99 A **5 Claims**



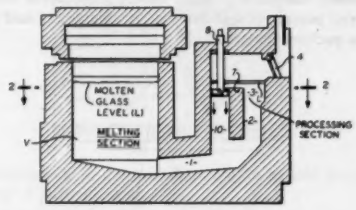
1. In a glassmaking apparatus comprising a glassmaking furnace and a glass forming chamber joined through a molten glass delivery means having a molten glass-supporting member and side members forming a glass flow channel and a tweel extending transversely across the channel for metering the flow of molten glass therethrough, the improvement which comprises a composite tweel having a lower, glass-contacting portion of a substantially glassy silica wherein the lower, glass-contacting portion of the tweel is connected to an upper portion of the tweel of thermal shock-resistant refractory material along an interface which is substantially immediately below a first intended glass surface intersection on an upstream face facing the glassmaking furnace and substantially immediately above a lower second intended glass surface intersection on a downstream face facing the glass forming chamber which second intersection is at a location below the intersection between the interface and the upstream face of the tweel.

4,099,951

GLASS MELTING FURNACE AND PROCESS WITH RECIRCULATION OF MOLTEN GLASS

Helmut Pieper, Lohr, Germany, assignor to Sorg GmbH & Co. KG, Plochsbach, Germany

Continuation-in-part of Ser. No. 694,863, Jun. 10, 1976, Pat. No. 4,046,547. This application Jun. 7, 1977, Ser. No. 804,404
Int. Cl.[2] C34B *5/18*
U.S. Cl. 65—135 **8 Claims**



1. Method for operating a glass melting furnace having a melting zone and at least one processing zone disposed adjacent to said melting zone and which is connected by a passage thereto, the method which comprises causing molten glass to flow from said melting zone to said processing zone, withdrawing a portion of the molten glass from the top of said processing zone laterally in a surface flow, recirculating the withdrawn portion of molten glass to said processing zone or to a separate refining zone by flowing the recirculated portion of molten glass into the passage connecting the melting zone and the processing zone and applying a submerged, downwardly directed impulse to the recirculated glass.

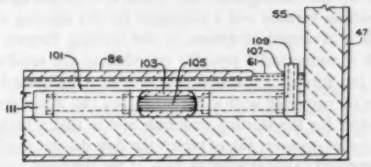
4. Glass melting furnace comprising melting means and at least one processing tank means communicating with said melting means through passage means, recirculating passage means connecting the top of the processing tank means and said passage means, and means connected with said passage means for establishing a recirculating flow of molten glass via said recirculating passage means comprising submerged agitator means operating in the direction of flow for applying a submerged downwardly directed impulse to the recirculating glass.

4,099,952

MOVABLE SUBMERSIBLE DAM BARRIER FOR USE IN A GLASS FORMING CHAMBER

Ronald L. Schwenninger, Wiley Ford, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 18, 1977, Ser. No. 816,424
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—182 R **10 Claims**



1. In a glass forming chamber comprising an enclosure con-

taining a pool of molten metal for supporting glass during its formation as the glass is advanced along the surface of the pool of molten metal and cooled to form a continuous sheet of glass, wherein submersible dam barriers are provided in the pool of molten metal beneath its surface for selectively controlling the flow of molten metal to establish desired thermal conditions, each submersible dam barrier comprising an inner body of material more dense than the molten metal and an outer covering of material which is substantially free from attack by the molten metal, the improvement which comprises

an inner body comprising a dense metal packed in a particulate material within said outer covering wherein said particulate material provides a sufficient void space for the passage of a gas through it along the interior portion of the dam barrier inside said outer covering and

means connected to an end of said dam barrier for venting the interior portion of said dam barrier including a substantially enclosed conduit in communication with the interior portion of said dam barrier containing said particulate packing material.

4,099,953

INSTALLATION FOR HEATING STARTING MATERIALS FOR GLASS MELTING

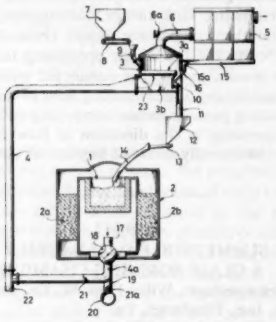
Louis Rondeaux, Velaines; Jules Legrand, Brussels, both of Belgium, and Claude Baelde, Saint-Germain en Laye, France, assignors to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Nov. 10, 1977, Ser. No. 850,087

Claims priority, application Belgium, Nov. 12, 1977, 848251

Int. Cl.[2] C03B 5/16

U.S. Cl. 65—335 **15 Claims**



1. An installation for heating starting materials intended for the melting of glass comprising a melting furnace and a preheater for the starting materials which is arranged upstream of the melting furnace and a preheater for the starting materials which is arranged upstream of the melting furnace and to which is connected a pipe for introducing the residual gases from the furnace, characterised in that a fluidised-bed preheater (3) provided with a discharge lack (**10, 37**) is used as the preheater for the starting materials and in that a high-performance dust remover (**5**), of which the dust discharge pipe (**15***a*) is connected to the discharge lock of the fluidised bed, is connected to the residual gas pipe (**6**) of the fluidised-bed preheater. lock

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4,099,954

AMIDE PHOSPHOROTHIOLATE HERBICIDES

Shunichi Hashimoto, Takarazuka, and Kunio Mukai, Nishinomiya, both of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

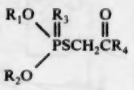
Filed Aug. 11, 1976, Ser. No. 713,595

Claims priority, application Japan, Aug. 28, 1975, 50-104630; Mar. 31, 1976, 51-36541

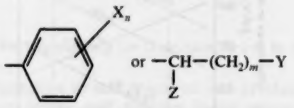
Int. Cl.[2] A01N 9/36; C07F 9/65, 9/60, 9/18

U.S. Cl. 71—87 **5 Claims**

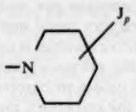
1. A compound of the formula:



wherein R_1 and R_2 are each a group of the formula



in which X is lower alkyl or halogen; Y is halogen; Z is hydrogen or methyl; *m* is an integer of 1 to 2; *n* is an integer of from 0 to 2; R_3 is oxygen or sulfur; R_4 is



in which J is lower alkyl and *p* is an integer of from 0 to 2; pyrrolidino or hexamethyleneimino.

4. A herbicidal composition which comprises as an active ingredient an effective amount of the compound according to claim **1**, and an inert carrier.

5. A method for controlling the undesired growth of grasses or weeds which comprises applying an effective amount of the compound according to claim **1** to the area where the control of the grasses or weeds is desired.

4,099,955

PLANT REGULATING COMPOUNDS

Claude Clapot, Oullins; Jean Vial, Tassin, and Louis Dumont, Chaponost, all of France, assignors to Philagro, Lyons, France

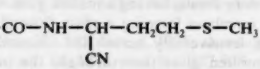
Continuation-in-part of Ser. No. 472,471, May 22, 1974, Pat. No. 3,990,883, which is a division of Ser. No. 725,295, Sep. 21, 1976. This application Oct. 20, 1976, Ser. No. 734,172

Claims priority, application France, May 22, 1973, 73 19579

Int. Cl.[2] A01N 9/12

U.S. Cl. 71—98 **12 Claims**

1. A composition for plant growth regulation comprising an inert agricutural carrier and an amount sufficient to regulate plant growth of a compound of the formula



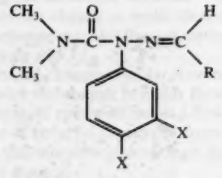
wherein R is H, alkyl of 1–5 carbons naphthyl, phenyl or chlorinated phenyl with the proviso that R is not 3,5-dichlorophenyl.

4,099,956
HERBICIDAL SEMICARBAZONES

Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 466,103, May 20, 1974, which is a continuation of Ser. No. 283,686, Aug. 25, 1972, abandoned.
This application Oct. 15, 1976, Ser. No. 732,678
Int. Cl.[2] A01N *9/20*
U.S. Cl. 71—120 7 Claims

1. A compound of the formula



wherein R is hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms and one of X is halogen of atomic number 9 to 35 inclusive, or trifluoromethyl and the other is halogen or alkoxy in which the alkyl portion is straight or branched chain and contains from 1 to 4 carbon atoms.

4,099,957
RIPENING OF SUGARCANE BY USE OF ALCOHOLS

Louis G. Nickell, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed May 25, 1977, Ser. No. 800,341
Int. Cl.[2] A01N *9/24*
U.S. Cl. 71—122 15 Claims

1. A process for increasing the sugar yield of grown sugarcane which comprises applying an effective amount of isobutanol as a sugarcane ripening agent to the cane at a time at least about 2 and up to about 10 weeks prior to harvest.

4,099,958
METHOD OF PRODUCING VANADIUM

Donald R. MacRae, Bethlehem; Richard G. Gold, Coopersburg; William R. Sandall, and Charles D. Thompson, both of Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 9, 1976, Ser. No. 675,672
Int. Cl.[2] C22F *1/02*; C22B *34/22*; C22C *1/04*
U.S. Cl. 75—0.5 BA 3 Claims

1. A method of producing vanadium and alloys thereof, comprising:

(a) introducing a blended dispersal of discrete particles of vanadium oxides and a carbonaceous substance into a plasma arc torch,

(b) establishing an arc in said torch to at least partially melt said blended particles together, and

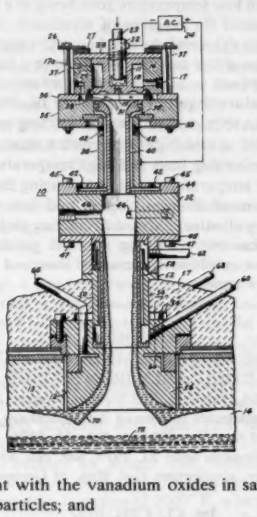
(c) causing said blended, at least partially melted particles to slowly descend along the walls of said torch whereby the carbon in said carbonaceous substance reduces said vanadium oxides substantially completely to vanadium metal.

3. A method of producing vanadium and alloys thereof, comprising:

(a) partially reducing a first mixture of solid particles comprising primarily vanadium pentoxide into a second mixture of solid particles comprising primarily a higher melting point vanadium oxide in which iron powder is added to said second mixture of solid particles to lower the melting point of said second mixture;

(b) supplying a stabilizing gas stream adjacent the cathode of a plasma arc torch comprising a cathode and an anode;

(c) introducing said second mixture of solid particles into said torch between the ends of said anode, establishing an arc between said cathode and said anode, and reacting a



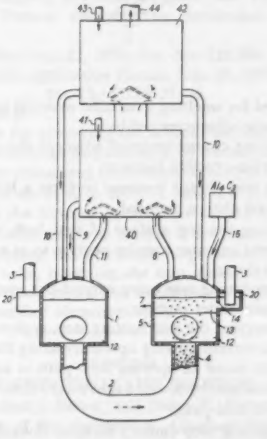
reductant with the vanadium oxides in said second mixture of particles; and

(d) recovering vanadium and alloys thereof.

4,099,959
PROCESS FOR THE PRODUCTION OF ALUMINIUM

Ernest William Dewing, Arvida; Jean-Paul Robert Huni, Kingston; Raman Radha Sood, Arvida, and Frederick William Southam, Kingston, all of, Calif., assignors to Alcan Research and Development Limited, Montreal, Canada

Filed May 23, 1977, Ser. No. 799,762
Claims priority, application United Kingdom, May 28, 1976, 22474/76
Int. Cl.[2] C22B *21/02*
U.S. Cl. 75—10 R 19 Claims



1. A process for the production of aluminium metal which includes the steps of establishing a circulating stream of molten alumina slag containing combined carbon in the form of at least one of aluminum carbide and aluminum oxycarbide, circulating said stream of molten alumina slag through a series of alternately arranged low temperature zones and high temperature zones, each low temperature zone being maintained at

least in part at a temperature at or above that required for reaction of alumina with carbon to form aluminium carbide but the whole of each low temperature zone being at a temperature below that required for reaction of aluminium carbide with alumina to release Al metal, forwarding said stream of molten alumina slag from a low temperature zone to a high temperature zone maintained at least in part at a temperature at or above a temperature required for reaction of aluminium carbide with alumina to release Al metal, collecting and removing Al metal released at said high temperature zone, forwarding said molten alumina slag from said high temperature zone to a succeeding low temperature zone, introducing carbon to the circulating stream of alumina slag in said low temperature zone, introducing alumina into said circulating slag stream at at least one location and removing evolved gases, said series including at least one low temperature zone and at least one high temperature zone.

4,099,960

METHOD OF SMELTING METALLIC MATERIAL, PARTICULARLY IRON SPONGE

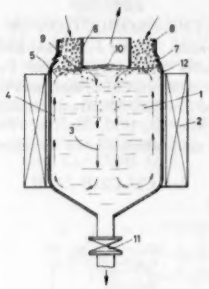
Bernd Olschewski, Duisburg, and Werner Wenzel, Aachen, both of Germany, assignors to Demag A.G. Duisburg, Germany

Continuation of Ser. No. 658,041, Feb. 13, 1976, abandoned. This application May 31, 1977, Ser. No. 801,651

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1975, 2506926

Int. Cl.[2] C21C *5/52*

U.S. Cl. 75—11 **1 Claim**



1. A method for smelting a metallic material in an induction crucible furnace, characterized by

(a) introducing charge material adjacent the top surface of an induction crucible furnace;

(b) heating said charge material to form a hot bath and to reduce said charge material;

(c) separating the top surface of said bath into a central portion and an outer annular portion so as not to produce a central dome;

(d) said introducing step being carried out continuously into said annular outer portion;

(e) while carrying out said heating step, applying an induced magnetic current flowing upwardly along the walls of said furnace to cause an upward flow path in said bath along the walls of said bath, and a downward flow path adjacent the axis of said path;

(f) said applying step causing a radial inward flow in said bath adjacent the top surface toward the axis of said bath;

(g) said introducing step causing impact of said introduced charge material with said upward flow path and the movement thereof radially inwardly toward the axis of said bath;

(h) collecting slag from said bath at the segregated central portion of the surface thereof;

(i) removing slag from said segregated central portion; and

(j) withdrawing said reduced material adjacent the bottom of said furnace as product.

4,099,961

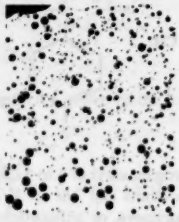
CLOSED CELL METAL FOAM METHOD

James W. Patten, Kennewick, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 21, 1976, Ser. No. 752,935

Int. Cl.[2] C22F *1/02, 1/04, 1/08, 1/11*

U.S. Cl. 75—20 F **7 Claims**



1. Method for preparing a metal or metal alloy foam body having a closed cellular structure comprising:

a. preparing, by sputter deposition, a solid metal or metal alloy body containing entrapped atoms of inert gas evenly distributed throughout the body;

b. heating the body containing the entrapped gas to a temperature slightly above the melting temperature of the metal;

c. maintaining the temperature for a period of time sufficient to permit the entrapped gas to expand within the molten body to form individual cells of expanded entrapped gas; and

d. cooling the body containing the entrapped expanded gas to below the melting temperature of the metal, thereby forming a metal foam body having a closed cellular structure.

4,099,962

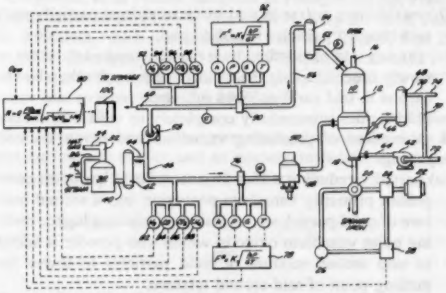
METHOD AND APPARATUS FOR MEASURING AND CONTROLLING THE PERCENTAGE REDUCTION OF ORE IN A MOVING BED GASEOUS REDUCTION REACTOR

Patrick W. MacKay; Enrique Martinez Vera, and Ramon de la Pena, all of Monterrey, Mexico, assignors to Grupo Industrial Alfa, S.A., Monterrey, Mexico

Filed Jan. 5, 1976, Ser. No. 646,496

Int. Cl.[2] C22B *1/10*

U.S. Cl. 75—26 **9 Claims**



1. A process for producing sponge metal by the gaseous reduction of oxidic metal ore in a vertical moving bed reactor,

said process comprising the steps of charging ore to the reactor, feeding a reducing gas comprising carbon monoxide, hydrogen, methane and carbon dioxide through the ore in said reactor, cooling the effluent gas from said reactor to remove water therefrom, and determining the extent to which reduction of said ore occurs in said reactor by

(1) measuring the flow and composition of the reducing gas at a first location before said gas enters said reactor,

(2) measuring the flow and composition of the effluent reducing gas from the reactor at a second location after the effluent gas has been cooled,

(3) determining the difference between

(a) the sum of the change in molar flow of hydrogen and twice the change in molar flow of methane between said two locations and

(b) the sum of the change in molar flow of carbon monoxide and twice the change in molar flow of carbon dioxide between said two locations as a first value indicative of the rate of removal of oxygen from said ore.

(4) measuring the rate at which sponge metal is processed through said reactor,

(5) effectively determining from said processing rate a second value indicative of the rate at which reducible oxygen enters said reactor with said ore and

(6) comparing said first and second values to obtain a third value indicative of the percentage reduction in said reactor.

4,099,963

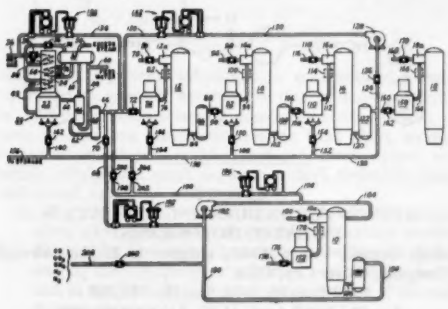
METHOD FOR THE BATCHWISE REDUCTION OF METAL ORES

Patrick W. MacKay, Monterrey, Mexico, assignor to Fierro Esponja, S.A., Monterrey, Mexico

Continuation-in-part of Ser. No. 635,655, Nov. 26, 1975, Pat. No. 4,067,728, which is a continuation of Ser. No. 516,095, Oct. 18, 1974, abandoned. This application Jun. 16, 1976, Ser. No. 696,488

Int. Cl.[2] C21B *13/02*

U.S. Cl. 75—35 **27 Claims**



1. A method for the batchwise gaseous reduction of metal oxides to metals in a multiple unit reactor system of the type in which separate fixed beds of metal-bearing material are simultaneously treated in a plurality of interchangeable reactors including a cooling reactor and at least one reduction reactor, which method comprises preparing a preformed reducing gas composed largely of carbon monoxide and hydrogen outside of the reactor system causing at least a portion of said preformed reducing gas to flow successively through the bed of metal-bearing material in said cooling reactor and then through the bed of metal-bearing material in said reduction reactor or reactors, heating said reducing gas before it is fed to each said reduction reactor or reactors, cooling and de-watering said gas after it leaves each said reduction reactor or reactors, and after said reducing gas has passed through said cooling reactor mixing a small amount of fluid hydrocarbon with the reducing gas fed to at least one reduction reactor of said system prior to the point at which said reducing gas is heated, to increase the productivity of said reduction system.

4,099,964

RECYCLING OF IRON VALUES

Maurice D. Henery, Evanston; Ernest B. Snyder, South Holland, and Walter W. Walker, Matteson, all of Ill., assignors to Marblehead Lime Company, Chicago, Ill.

Continuation of Ser. No. 662,943, Mar. 1, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 772,933

Int. Cl.[2] C21C *7/00, 5/36*

U.S. Cl. 75—52 **5 Claims**

1. In the operation of a basic oxygen furnace wherein iron is introduced along with a flux addition to provide a furnace charge for refining the iron, said flux addition including dolomitic lime in amounts between 15 and 60 pounds per ton of furnace charge, a slag layer being formed in the furnace and an equilibrium condition of iron oxide content calculated as FeO being developed between the slag layer and the metal bath, the improvement comprising a method for recycling iron values from compounds comprising iron and iron oxide, said method comprising the steps of preparing a mixture by mixing such compounds in particulate form together with dolomite, the mixture including sufficient iron values such that the reaction products after calcination will contain in excess of 20 percent and up to 50 percent by weight iron values, calculated as Fe_2O_3, providing such calcination by heating the mixture in a kiln to a temperature in excess of 2000° F. whereby the output of the kiln comprises said reaction products, forming said flux addition by substituting said output in the flux addition in an amount from 20 to 100 percent of said dolomitic lime portion of the flux, and introducing the flux addition including said output from the kiln into said furnace along with said iron, said slag layer being enriched in iron oxide by reason of the presence of said output in said flux addition whereby the depletion of iron values from said bath in order to reach said equilibrium condition is substantially minimized.

4,099,965

METHOD OF USING $MgCl_2$-KCl FLUX FOR PURIFICATION OF AN ALUMINUM ALLOY PREPARATION

Jean Claude Béguin, Brussels, Belgium, and Pierre Guérit, Chambery, France, assignors to Servimetal, Chambery, France

Filed Sep. 22, 1976, Ser. No. 725,556

Claims priority, application France, Sep. 26, 1975, 75 30276

Int. Cl.[2] C22B *21/06*

U.S. Cl. 75—68 R **1 Claim**

1. A process for removing the sodium and calcium metals present in an aluminum-magnesium alloy consisting essentially of melting a flux containing from about 60 to 80% by weight of $MgCl_2$ and from about 40 to 20% by weight of KCl, distributing the flux in the form of grains over the bottom of a preheated casting ladle, whereby the flux is absorbed by the lining of the ladle, casting the aluminum-magnesium alloy in melt form into the ladle, purifying the cast aluminum-magnesium alloy by slow release of the flux in contact with the alloy, and recovering a purified aluminum alloy.

4,099,966

AUSTENITIC STAINLESS STEEL

Joseph A. Chivinsky, Sarver, and Harry E. Deverell, Natrona Heights, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Dec. 2, 1976, Ser. No. 746,968

Int. Cl.[2] C22C *38/16, 38/42, 38/58*

U.S. Cl. 75—125 **15 Claims**

1. A hot workable austenitic stainless steel of superior pitting and crevice corrosion resistance to the chloride ion, consisting essentially of, by weight, from 19 to 23% chromium, 8 to 16% nickel, 3.5 to 4.5% molybdenum, 7.5 to 15% manganese, up to

0.01% sulfur, 0.01 to 0.1% of at least one element from the group consisting of cerium, calcium and magnesium, nitrogen from 0.2% up to its solubility limit, up to 0.1% carbon, up to 1% silicon, up to 3% copper, up to 1% columbium, up to 0.3% vanadium, up to 0.3% titanium, balance essentially iron; said steel being characterized by a weight loss of one part or less in 10,000, in a 72 hour room temperature 10% ferric chloride, 90% distilled water rubber band test.

4,099,967

GALLING RESISTANT AUSTENITIC STAINLESS STEEL

William J. Schumacher, and Harry Tanczyn, both of Baltimore, Md., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Dec. 14, 1976, Ser. No. 751,022
Int. Cl.[2] C22C *38/02, 38/58*
U.S. Cl. 75—128 A **2 Claims**

1. Austenitic stainless steel having a galling resistance of at least 40 ksi stress when rotated against itself by the test described herein, a stress corrosion resistance of greater than 90 hours to failure at 50–60 ksi stress in boiling magnesium chloride (42% concentration), a Huey rate of not greater than 0.005 inches per month after reheating at 850° C for a time up to four hours, and good high temperature oxidation resistance, consisting essentially of, by weight percent, about 14 to about 16% chromium, about 14 to about 17% nickel, 0.5 to about 3.0% manganese, about 4.0 to about 5.5% silicon, about 0.03 to about 0.10% carbon, about 0.03% maximum nitrogen, about 0.05% maximum phosphorus, about 0.05% maximum sulfur, and balance iron except for incidential impurities.

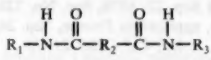
4,099,968

DICARBOXYLIC ACID BIS-AMIDES IN ELECTROSTATIC IMAGING COMPOSITIONS AND PROCESSES

Charles G. Scouten, Webster, N.Y., and Willard C. Hamilton, Morganville, N.J., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 3, 1976, Ser. No. 692,255
Int. Cl.[2] G03G *9/00, 13/08*
U.S. Cl. 96—1 SD **8 Claims**

1. An image developing material comprising particles, said particles including finely divided toner material and an active amount, based on the weight of said toner material, of a separate additive of the formula



wherein R_1 and R_3 are individually defined as a H, phenyl, lower alkyl-substituted phenyl, or lower alkyl group, where lower alkyl contains from 1 to about 7 carbon atoms in a branched, unbranched, or cyclic configuration; and

R_2 is defined as an alkylene group of 2 to about 22 carbon atoms, phenylene, naphthylene, lower alkyl-substituted phenylene, or lower alkyl-substituted naphthylene group in which lower alkyl substituents contain 1 to about 7 carbon atoms in straight, branched, or cyclic chain configuration.

4,099,969

COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTORS

Lewis B. Leder, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 513,695, Oct. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 477,737, Jun. 10, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 605,135
Int. Cl.[2] B05D *3/06*
U.S. Cl. 96—1.5 R **16 Claims**

1. A method for obtaining flexible photoreceptors having improved durability and adhesion between a metal- or metal-coated substrate thereof, and a photoconductor layer thereof containing inorganic photoconductive material in charge blocking contact with the substrate, comprising exposing a clean oxide-coated conductive substrate to an ambient atmosphere consisting of one or more inert gases, a vapor cloud containing photoconductive material in a glow discharge, said atmosphere being nonreactive with said photoconductive material so that no new photoconductive materials are formed during said glow discharge.

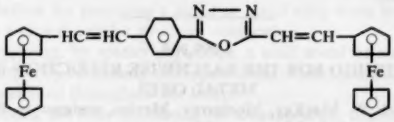
4,099,970

DERIVATIVES OF 1,3,4-OXADIAZOLE AND ELECTROPHOTOGRAPHIC ELEMENTS CONTANING SAME

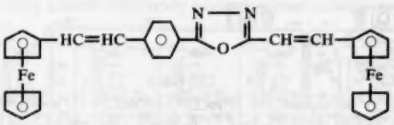
Mitsuo Okazaki, Tama; Akihiro Yamaguchi, Yokohama, and Masaomi Sasaki, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 784,618, Apr. 4, 1977. This application Dec. 22, 1977, Ser. No. 863,128
Claims priority, application Japan, Apr. 12, 1976, 51-40374
Int. Cl.[2] C07D *271/00;* **G03G** *5/06*
U.S. Cl. 96—1.5 N **7 Claims**

1. A compound having the formula



2. In an electrophotographic plate comprising a conductive support and a photosensitive layer on said support, said photosensitive layer consisting essentially of charge-generating pigment, charge-transport material and binder agent, the improvement which comprises: said charge-transport material is a compound having the formula



4,099,971

METHOD FOR FABRICATING REFLECTION INFRARED HOLOGRAMS

Andrejs Graube, Venice, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 30, 1976, Ser. No. 755,755
Int. Cl.[2] G03C *5/04, 11/00, 5/32;* **G02B** *3/00*
U.S. Cl. 96—27 H **6 Claims**

1. A method of forming a reflective latent hologram suitable for reconstruction at infrared wavelengths comprising:

(a) first exposing a photographic silver halide emulsion film to the coherent beams emanating from a visible light source to form a latent image in said film comprised of fringe lines having preselected spacings and orientations,

(b) causing said exposed film to be developed and fixed in a manner suitable for conventional photographic processes,

(c) treating said film with swelling agents which cause said film to expand until a preselected volume is obtained and said fringe line spacings have been increased to a preselected distance thereby enabling said film to reflect IR radiation, and

(d) geometrically fixing said expanded film to prevent further expansion or loss in volume.

4,099,972

DYE IMAGE FORMING PROCESS USING SHIFTED AZO DYE DEVELOPER

Yuzuru Sato; Ryuichiro Kobayashi, both of Hachioji; Naoshi Kunieda; Kazumasa Watanabe, both of Tokyo; Noboru Mizukura, Hachioji; Kenji Yoshida, Yokohama, and Tadanori Oya, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Konishiroku Photo Industry Co., Ltd., both of Tokyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,548

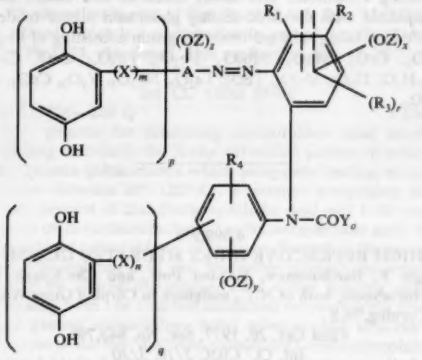
Claims priority, application Japan, Aug. 2, 1975, 50-94293; Jun. 19, 1976, 51-72402

Int. Cl.[2] G03C 5/54, 1/40, 1/10

U.S. Cl. 96—29 D 5 Claims

1. In a process for forming a dye image on a receiving element by diffusion transfer from a photosensitive element comprising a support and a silver halide photosensitive layer thereon wherein said photosensitive element is imagewise exposed, the improvement comprising:

(a) processing the exposed photosensitive element with an alkaline solution in the presence of a dye developer having one azo radical therein to form an image of a diffusible dye in said photosensitive element, said dye developer being represented by the formula



wherein A represents substituted or unsubstituted aromatic hydrocarbon, aromatic heterocyclic ring, or active methylene or active methine-containing compound-residue which can have at least one substituent selected from alkyl, aromatic hydrocarbon, alkoxy, aryloxy, halogen, nitro, cyano, acylamino, alkylamino, amyl, acyloxy, aralkyl, hydroxyl, amino, carbamoyl, sulfamoyl, and arylamino;

R_1, R_2, and R_3 individually represent hydrogen, halogen, nitro, alkyl, halogen-substituted alkyl, alkyloxy, aryloxy, alkylamido, arylamido, carbamoyl or sulfamoyl, and R_1 and R_2 can co-operatively form a naphthalene nucleus and, in that case, R_3 is bonded to any position of the naphthalene nucleus;

R_4 represents hydrogen, alkyl, aromatic hydrocarbon, alkoxy, aryloxy, halogen, nitro, cyano, acylamino, alkylamino, amyl, acyloxy, aralkyl, hydroxyl, amino, carbamoyl, sulfamoyl, and arylamino;

X represents a —CO—, —N(alkyl)—, —NH—, —S—, —O—, $—SO_2—$, alkylene, allylene, —NHCO alkylene—, $—SO_2NH$ alkylene—, NHCO alkylene S—, divalent alicyclic or divalent heterocyclic group;

Yo represents alkyl of 1 to 5 carbon atoms being substituted with at least one halogen in at least one of α- or β- positions of the alkyl, $—OZ_o$ or

in which Z_o is unsubstituted or substituted alkyl of 1 to 5 carbon atoms or unsubstituted or substituted phenyl, and X_o is hydrogen or a substituent as defined in Z_o,

Z represents hydrogen or acyl; m and n are individually a value of 0 or 1; p and q are individually a value of 0 or 1, but the sum of p and q is 1 or more, r is an integer of 1 to 5; and x, y and z are individually a value of 0, 1 or 2, provided that when A is aromatic hydrocarbon, $x+y+z$ is 1 or 2 and, when A is other than aromatic hydrocarbon, $x+y$ is 1 or 2; and

(b) superimposing the receiving element on the photosensitive element at least during said processing step whereby the diffusible dye image is transferred onto the receiving element.

4,099,973

PHOTO-SENSITIVE BIS-AZIDE CONTAINING COMPOSITION

Kiyoshi Miura, and Yoshifumi Tomita, both of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 497,035, Aug. 13, 1974, abandoned. This application Sep. 14, 1976, Ser. No. 723,063

Claims priority, application Japan, Oct. 24, 1973, 48-119007

Int. Cl.[2] G03C 1/52, 1/70

U.S. Cl. 96—115 R 7 Claims

1. A photosensitive composition consisting essentially of an admixture of crosslinking agent consisting of a bisazide compound, a water-soluble polymer substance which may be photo-crosslinked by said bisazide compound and an effective amount of a water-soluble alcohol having 4 to 6 hydroxyl groups to accelerate a photo-crosslinking reaction between said water-soluble polymer substance and said bisazide compound when said composition is exposed to a small dosage of ultraviolet rays, said water-soluble polymer substance being selected from the group consisting of polyvinyl pyrrolidone, polyacrylamide, polyvinyl alcohol, gelatine, acrylamide-diacetone acrylamide copolymer, acrylamide-vinyl alcohol copolymer, acrylamide-vinylpyrrolidone copolymer and a mixture thereof.

4,099,974

ELECTROLESS COPPER SOLUTION

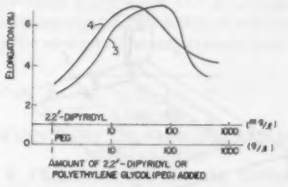
Hirosada Morishita; Mineo Kawamoto; Motoyo Wajima, and Kanji Murakami, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 10, 1976, Ser. No. 665,708

Claims priority, application Japan, Mar. 14, 1975, 50/30147

Int. Cl.[2] C23C 3/02

U.S. Cl. 106—1.23 8 Claims



1. In an electroless copper solution containing an aqueous solution consisting of a copper salt, a complexing agent, a reducing agent and pH-adjusting agent, and having a high pH, the improvement wherein said copper solution further contains 5 to 300 mg/l 2,2'-dipyridyl or 1 to 50 mg/l of 2,9-dimethyl-1,10-phenanthroline and at least 1 g/l of polyethylene glycol, has a pH of 12.5 to 13.5, measured at 20° C. and is capable of providing a copper film having an elongation greater than 3%.

4,099,975

INTUMESCENT FIRE RETARDANT COMPOSITIONS CONTAINING PENTAERYTHRITOL CYCLIC DIPHOSPHATES

James A. Albright, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

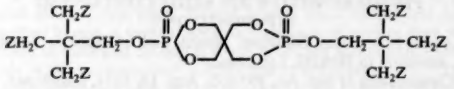
Continuation-in-part of Ser. No. 616,935, Sep. 26, 1975, Pat. No. 3,978,167, which is a continuation-in-part of Ser. No. 429,607, Jan. 2, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,282

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.[2] C08K 5/53

U.S. Cl. 106—15 FP 9 Claims

1. An intumescent composition comprising a coating vehicle and an intumescing amount of an intumescent agent of the formula



wherein each Z is independently selected from the group consisting of hydrogen and halogen.

4,099,976

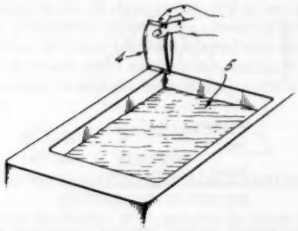
WATER-DISPERSIBLE BIODEGRADABLE COMPOSITIONS AND CONTAINERS AND THE LIKE MADE THEREFROM

Kenneth S. Kraskin, Milltown, and Mohamed W. Hammad, Old Bridge, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Division of Ser. No. 527,737, Nov. 27, 1974, Pat. No. 3,954,104. This application Jan. 21, 1976, Ser. No. 651,081

Int. Cl.[2] C08L 1/28; C09J 3/04

U.S. Cl. 106—15 R 14 Claims



1. A thermoplastic, water-dispersible, biodegradable composition of matter comprising hydroxyalkyl cellulose, starch, and an antimycotically-effective amount of a member selected from the group consisting of sorbic acid and its alkali metal salts, whereby the composition is biodegradable after disposal but resistant to fungal attack prior to dispersal.

4,099,977

SEALING GLASS VEHICLE AND COMPOSITION AND METHOD FOR MAKING SAME

Josef Francel; James E. King, both of Toledo, and John M. Woulbroun, Grand Rapids, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 637,351, Dec. 3, 1975, Pat. No. 4,038,091, which is a division of Ser. No. 516,900, Oct. 22, 1974, Pat. No. 3,973,975, which is a continuation-in-part of Ser. No. 246,316, Apr. 21, 1972, abandoned, and a continuation-in-part of Ser. No. 511,202, Oct. 1, 1974, Pat. No. 3,967,973, which is a continuation of Ser. No. 246,316, Apr. 21, 1972, abandoned. This application Jun. 27, 1977, Ser. No. 810,231

Int. Cl.[2] C03C 3/10, 3/04

U.S. Cl. 106—53 20 Claims

1. In a sealing glass paste comprising a PbO-containing sealing glass frit, a binder for said frit and a solvent for said binder, the improvement wherein said sealing glass paste having present with said sealing glass frit an amount of powder sufficient to prevent reduction of the PbO during sealing of said sealing glass frit, said powder being a higher oxide of a cation which is thermally stable at the temperature at which such sealing glass frit seals and which can be chemically reduced to a lower oxide of the cation when exposed to said reducing conditions, said lower oxide of said cation being compatible with the fired sealing glass, said higher oxide of said cation being selected from the group consisting of Pb_3O_4, BaO_2, CrO_3, MnO_2, Mn_2O_3, Fe_2O_3, Fe_3O_4, CuO, Cu_2O, $Zr_2.H_2O$, Tl_2O_3, Sb_2O_3, TeO_2, Ta_2O_5, Nb_2O_5, V_2O_5, CeO_2, and Bi_2O_3.

4,099,978

HIGH REFRACTIVE INDEX HYDRATED GLASSES

Roger F. Bartholomew, Painted Post, and Che-Kuang Wu, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,798

Int. Cl.[2] C03C 3/10, 3/30

U.S. Cl. 106—53 3 Claims

1. A hydrated glass of optical quality with an essentially colorless, transparent appearance and a refractive index in excess of 1.60 consisting essentially, on the anhydrous basis in mole percent on an oxide basis, of 8–18% Na_2O, 2–6% K_2O, 10–23% $Na_2O + K_2O$, >15 but <21% PbO, 55–67% SiO_2, the mole ratio $PbO:SiO_2$ being >0.225 but <0.3, and an amount of BaO and/or Y_2O_3 and/or ZnO and/or ZrO_2 effective to render the hydrated glass essentially colorless up to the indicated maxima of 5% BaO, 5% Y_2O_3, 8% ZnO, and 5% ZrO_2, the total $BaO + Y_2O_3 + ZnO + ZrO_2$ not exceeding 10%.

4,099,979

Si_3N_4 HOT PRESSED WITH MgO

Frederick F. Lange, Thousand Oaks, Calif., and Clarence A. Andersson, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

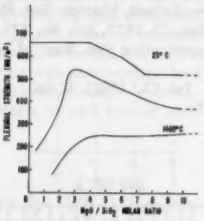
Filed Dec. 29, 1976, Ser. No. 755,384

Int. Cl.[2] C04B 33/32, 35/58

U.S. Cl. 106—58 3 Claims

1. A structural material suitable for use at elevated temperatures consisting essentially of silicon nitride, silicon dioxide and magnesium oxide, the molar ratio of MgO to SiO_2 being within the range between about 3 and about 5, the MgO content not

exceeding 6% by weight and the CaO content not exceeding 200 ppm, and the silicon nitride phases are between 83 and



93% alpha phase and between 7 and 17% beta phase and silicon is ≦ 1%.

4,099,980

PROCESS FOR PRODUCING GAMMA QUINACRIDONE SOLID SOLUTIONS

Robert Jarl North, Elmwood Park, N.J., assignor to Harmon Colors Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 643,443, Dec. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 518,558, Oct. 29, 1974, abandoned. This application Jan. 17, 1977, Ser. No. 759,691

Int. Cl.[2] C09B *48/00*

U.S. Cl. 106—288 Q 7 Claims

1. A process for producing quinacridone solid solutions exhibiting essentially the X-ray diffraction pattern of unsubstituted gamma quinacridone which comprises heating, at a temperature between 80°–120° C., a mixture comprising 80–99 weight percent of dianilinoterephthalic acid and 1–20 weight percent of di-(orthosubstituted) anilinoterephthalic acid, 4,11-disubstituted quinacridone, or mixtures thereof, in the presence of polyphosphoric acid and thereafter diluting the reaction mixture by adding the mixture to a water miscible alcohol containing from 1 to 3 carbon atoms and recovering the precipitated gamma quinacridone solid solution, and wherein the substituents on the di-(ortho-substituted) anilinoterephthalic acid or 4,11-disubstituted quinacridone are halogens, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogenated alkyl of 1 to 4 carbon atoms or carboalkoxy of 1 to 4 carbon atoms.

4,099,981

SULFUR CONTAINING SILANE COUPLING AGENTS

Jeffrey Yick-Pui Mui, Tarrytown, and Arthur Noah Pines, Katonah, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 536,207, Dec. 24, 1974, Pat. No. 4,044,037. This application May 19, 1977, Ser. No. 798,625

Int. Cl.[2] C09C *1/28*

U.S. Cl. 106—308 Q 8 Claims

1. An inorganic mineral filler treated with a polysulfide aryl silane coupling agent having the average formula

$$[X_{3-y}-\underset{\displaystyle R'_y}{\overset{|}{Si}}-(R)_n-Ar]_a[(S)_x]_b$$

wherein X is a hydrolyzable group selected from the class consisting of halogen, alkoxy, and acyloxy radicals; R′ is an alkyl radical containing from 1 to 4 carbon atoms; *y* has a value of 0 to 2 inclusive; R is a divalent bridging group selected from the class consisting of alkylene and alkyleneoxy radicals containing from 1 to 7 carbon atoms; *n* has a value of 0 or 1; Ar is an aryl radical containing from 6 to 12 carbon atoms; $(S)_x$ is a divalent polysulfide radical each free valence thereof being directly bonded to an aromatic carbon atom of an Ar radical whereby each Ar radical is bonded to another Ar radical through a $(S)_x$ radical, *x* has a value of from 2 to 6; *a* has a value of at least 2; *b* has a value of at least 1; and wherein the ratio of *a* to *b* is a value ranging from 0.4 to 2; and hydrolyzates and condensates thereof.

4,099,982

METHOD OF EVAPORATING AND SPRAY DRYING OF A SUCROSE SOLUTION

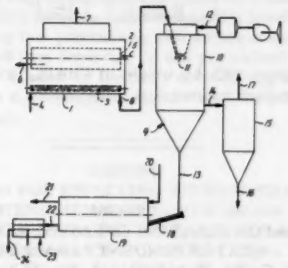
Ove Hansen, Vaerløse, and Stig Rasmussen, Gadstrup, both of Denmark, assignors to A/S Niro Atomizer, Soborg, Denmark

Filed Oct. 31, 1977, Ser. No. 847,366

Claims priority, application Denmark, Nov. 1, 1976, 4935/76

Int. Cl.[2] C13F *1/02*

U.S. Cl. 127—61 2 Claims



1. A method of evaporating and spray drying a sucrose solution, comprising evaporating the sucrose solution continuously while subjecting it to vigorous mechanical agitation, to produce a suspension of sucrose crystals in sucrose solution, spray drying in a spray drier said suspension without any preceding cooling-crystallization to achieve a material resembling wet snow and having a moisture content of between 0.5 and 5% by weight, wherein there is no recycling of sucrose crystals to the spray drier, and post-crystallizing and post-drying said material.

4,099,983

PROCESS FOR PREPARING HIGH PURITY LACTOSE

Lester H. Wittenberg, 103 Devoe Rd., Chappaqua, N.Y. 10514

Filed May 31, 1977, Ser. No. 801,874

Int. Cl.[2] C13K *5/00*

U.S. Cl. 127—63 10 Claims

1. A process for purifying lactose which comprises washing lactose crystals in an alkaline wash bath having a pH within the range of from about 8.5 to about 12.5 at a temperature sufficient to prevent undesirable dissolution of said lactose crystals and isolating the so-washed lactose crystals from the bath.

4,099,984

PROCESS FOR CLEANING FOULED HEAT EXCHANGERS

Christopher P. Christenson, and Gary M. McNamee, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

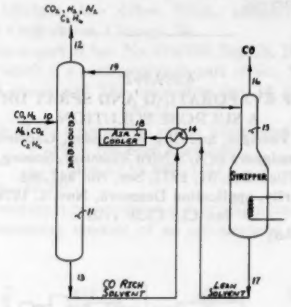
Filed May 3, 1977, Ser. No. 793,328

Int. Cl.[2] B08B *3/08*

U.S. Cl. 134—2 3 Claims

1. In a process for removing fouling from heat exchangers wherein the fouling is generated by passing a sorbent solvent solution containing $CuAlX_4$. solvent complex through said heat exchangers; the improvement which comprises removing said fouling by contacting the portion of said exchanger con-

taining said fouling with a sorbent solvent solution containing from about 1 to about 15% AlX_3 by weight and from about



20% to about 80% by weight of $CuAlX_4$. solvent complex wherein in each instance X is a halogen.

4,099,985

PROCESS FOR CLEANING GREASY SURFACES WITH A HEAT DEPENDENT ALKALI GEL

Donald F. Garvin, Wyandotte, and Otto T. Aepli, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 429,979, Jan. 2, 1974. This application Aug. 15, 1977, Ser. No. 824,914

Int. Cl.[2] B08B *3/08, 3/10*

U.S. Cl. 134—4 **4 Claims**

1. A process for the removal of greasy soil from a surface comprising applying a liquid composition to said surface while said surface is at a temperature of at least 100° F, sufficient to cause the composition to form a gel; permitting said composition to emulsify with said greasy soil; allowing said surface to cool to a temperature below 100° F, sufficient to cause said gel to revert to a liquid; and thereafter removing said emulsified greasy soil from said surface; wherein said composition consists essentially of water, an alkali metal hydroxide and a surfactant selected from the group consisting of

(a) an ethoxylated alcohol of the formula:

$$Y - O(C_2H_4O)_nH$$

wherein Y is a straight chain alkyl group having an average of 19 carbon atoms, n is an integer such that the hydrophile represented by (C_2H_4O) constitutes from about 75 to 95 weight percent of the total weight of the surfactant and the molecular weight of the ethoxylated alcohol is about 1500 and

(b) a polyoxyethylene-polyoxypropylene copolymer of the formula:

$$HO(C_2H_4O)_b(C_3H_6O)_a(C_2H_4O)_bH$$

wherein *a* is an integer such that the hydrophobe base represented by (C_3H_6O) has an average molecular weight of at least 3200 and *b* is an integer such that the hydrophile represented by (C_2H_4O) constitutes from about 70 to 95 weight percent of the copolymer,

wherein the concentration of alkali metal hydroxide in the composition is from about 1 weight percent to about 7 weight percent, the concentration of surfactant in the composition is from 4 weight percent to about 30 weight percent and the balance of the composition is water.

4,099,986

SOLAR CELL COMPRISING SEMICONDUCTIVE WHISKERS

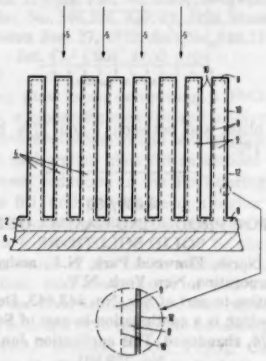
Heinrich Diepers, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 23, 1977, Ser. No. 827,026

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639841

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 TF **6 Claims**



1. In a solar cell having a semiconductor body with zones of opposite doping forming a p-n junction and each zone provided with an electrode, the improvement comprising the semiconductor body consisting of a plurality of single crystal semiconductor whiskers grown on a substrate surface.

4,099,987

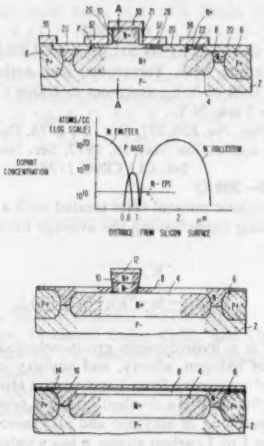
FABRICATING INTEGRATED CIRCUITS INCORPORATING HIGH-PERFORMANCE BIPOLAR TRANSISTORS

Chakrapani Gajanan Jambotkar, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,640

Int. Cl.[2] H01L *21/265, 7/54*

U.S. Cl. 148—1.5 **26 Claims**



1. A method for fabricating a semiconductor device comprising:

forming a mesa emitter in a silicon body,

passivating the said mesa emitter sidewall with a suitable dielectric;

forming a base region in said body using a blockout mask for a first ion implanation to form an extrinsic base region in said body surrounding said mesa emitter using high dose and low energy and a second ion implantation to form an intrinsic base region in said body below said mesa emitter and contiguous with said extrinsic base region using a low dose and high energy; and

providing contacts to said emitter and said extrinsic base region.

4,099,988

COMPOSITE MATERIAL HAVING WEAR- AND IMPACT-RESISTING SURFACE AND PROCESS FOR PRODUCING SAME

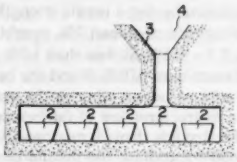
Kaoru Horiuchi, Toride; Akio Matsui, and Yoshio Okamoto, both of Chiba, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1977, Ser. No. 770,029

Claims priority, application Japan, Feb. 26, 1976, 51/20500; Feb. 26, 1976, 51/20501

Int. Cl.² B22D *19/02*

U.S. Cl. 148—3 **13 Claims**



1. A process for producing a composite material having at least one impact and wear resisting surface comprising the steps of:

placing on the bottom of a mold at least one wear resisting cast iron block having a chromium content of between 15 to 27%;

pouring into the mold a molten impact resisting cast steel;

allowing said molten cast steel to solidify, thereby forming a molded material;

removing said molded material from the mold; and

subjecting said molded material to a heat treatment after removal from said mold whereby said molded material is heated to a temperature of between 900° and 1150° C and then rapidly cooled in air.

4,099,989

PROTECTIVE COATING FOR ALUMINUM PRODUCTS

Geoffrey A. Dorsey, Jr., Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 610,966, Sep. 8, 1975, Pat. No. 4,004,951, which is a continuation-in-part of Ser. No. 593,092, Jul. 3, 1975, abandoned. This application Jul. 27, 1976, Ser. No. 709,027

Int. Cl.² C23F *7/00*

U.S. Cl. 148—6.27 **11 Claims**

1. A method of forming a tenacious, hydrophobic coating on an aluminum surface which is resistant to polar organic solvents consisting essentially of:

(a) mechanically disrupting the natural oxide coating on the aluminum surface to generate a fresh aluminum surface, and

(b) maintaining on the aluminum surface during said disruption an alkaline liquid selected from the group consisting of nonaqueous liquids and aqueous liquids having a pH of less than 10, said liquid having dissolved therein an effective amount of an aliphatic carboxylic acid or an equivalent carboxylate compound having from 12–22 carbon atoms so that upon generation of a fresh aluminum surface by said disruption a tenacious hydrophobic coating is formed.

4,099,990

METHOD OF APPLYING A LAYER OF SILICA ON A SUBSTRATE

David Emmerson Brown; John Trevor Kent Clark, both of Weybridge; John James McCarroll, Camberley, and Malcolm Leslie Sims, Walton-on-Thames, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Mar. 23, 1976, Ser. No. 669,636

Claims priority, application United Kingdom, Apr. 7, 1975, 14145/75

Int. Cl.² C23C *11/10*

U.S. Cl. 148—6.35 **9 Claims**

1. A process for forming protective films on a nickel, chromium or iron alloy substrate surface susceptible to coke formation, comprising first preoxidizing said surface at an elevated temperature and then depositing on said preoxidized substrate surface a layer of silica by thermally decomposing an alkoxy silane vapor in a carrier gas in contact with the preoxidized substrate surface.

4,099,991

METHOD FOR EFFECTING REVERSE SHAPE MEMORY PHENOMENA IN CU-ZN-SI BRASS ALLOY

Horace Pops, Fort Wayne, Ind., and Barry C. Johnson, Pittsburgh, Pa., assignors to Essex Group, Fort Wayne, Ind.

Continuation of Ser. No. 513,659, Oct. 10, 1974, which is a division of Ser. No. 338,360, Mar. 5, 1973, Pat. No. 3,854,200. This application Oct. 4, 1976, Ser. No. 728,975

Int. Cl.² C22F *1/08*

U.S. Cl. 148—11.5 C **2 Claims**

PROCESSING FLOW CHART FOR INTEGRATED CIRCUIT PACKAGE
METHOD I
METHOD II
METHOD III
α + β STRIP
α + β STRIP
α + β STRIP
FABRICATED INTO LEAD FRAMES
FABRICATED INTO LEAD FRAMES
BETATIZE STRIP 830°C
BEND FINGERS 90° TO STRAIN
BETATIZE LEAD FRAME 830°
QUENCH STRIP
BETATIZE LEAD FRAMES 830°
QUENCH LEAD FRAME
FABRICATE INTO LEAD FRAMES
QUENCH
BEND FINGERS 90° TO STRAIN
BEND FINGERS 90° TO STRAIN
FLATTEN FINGERS (RESTORE 1%)
HEAT TO 200°C SHAPE-MEMORY PROCESS FLATTENS FINGERS
HEAT TO 200°C SHAPE-MEMORY PROCESS FLATTENS FINGERS
ALIGN LEAD FRAME ABOVE CHIP
COOL TO ROOM TEMP.
COOL TO ROOM TEMP.
ALIGN LEAD FRAME ABOVE CHIP
ALIGN LEAD FRAME ABOVE CHIP
HEAT TO 200°C (~ 1% M.P. OF SOLDER) SHAPE-MEMORY PROCESS ALLOWS FINGERS TO MOVE AND BOND TO SOLDER
HEAT TO ~ 200°C (~ 1% M.P. OF SOLDER) REVERSE SHAPE-MEMORY ALLOWS FINGERS TO CONTACT SOLDER AND MAKE BOND
HEAT TO ~ 200°C (~ 1% M.P. OF SOLDER) REVERSE SHAPE-MEMORY ALLOWS FINGERS TO CONTACT SOLDER AND MAKE BOND

1. A method of heat treating a brass composition of about 62–65% by weight copper, 35–38% by weight zinc and 0.3–0.5% by weight silicon to provide a reverse shape memory effect comprising the steps of:

betatizing said material;

deforming said material up to 10% by bending at a temperature below the martensite transformation temperature of said material or just slightly above said temperature;

heating said deformed material to a temperature of less than 400° C. and above the martensite transformation temperature and maintaining said material isothermally whereby shape memory effect returns said material substantially toward the original undeformed condition; and

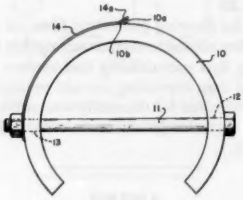
subsequently heating said material to a temperature in the range of 230° to 550° C. whereby said material reforms to the deformed condition by reverse shape memory effect.

4,099,992

TUBULAR PRODUCTS AND METHODS OF MAKING THE SAME

Leonard A. Pugliese, Murrysville, and James P. Stroup, Ligonier Township, Westmoreland County, both of Pa., assignors to Latrobe Steel Company, Latrobe, Pa.

Filed Apr. 11, 1977, Ser. No. 786,490
Int. Cl.² C21D *9/14*
U.S. Cl. 148—11.5 N **6 Claims**



1. A tubular metal product for use in sour gas wells characterized by resistance to hydrogen sulfide embrittlement at temperatures up to about 600° F. consisting essentially of an alloy having the composition up to about 0.035% maximum carbon, up to about 0.15% maximum silicon, up to about 0.15% maximum manganese, up to about 0.010% maximum sulfur, up to about 0.015% maximum phosphorus, about 19.0 to about 21.0% chromium, about 33.0% up to 37.0% nickel, about 9.0% to about 10.5% molybdenum, up to about 1.0% titanium, up to about 0.015% boron, up to about 2% iron and the balance cobalt, said tubular product having been cold worked at least sufficiently to impart increased strength and up to about 75% and thereafter heat treated in the range 1350° F. to 1500° F.

4,099,993

PROCESS FOR PRODUCING AN EXTREMELY HARD MIXED CARBIDE LAYER ON FERROUS MATERIALS TO INCREASE THEIR RESISTANCE TO WEAR

Hermann Müller, Heinrich Hall Str. 2A, 7501 Marxzell, and Otto Schaaber, Brauteichen 23, 282 Bremen 70, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 437,085, Jan. 28, 1974, abandoned. This application Jan. 22, 1976, Ser. No. 651,368
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1973, 2303756
Int. Cl.² C21D *1/74*
U.S. Cl. 148—14 **7 Claims**

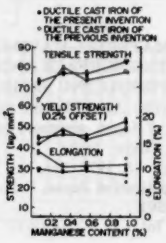
1. A process for producing an extremely hard, non-brittle adherent carbide layer on ferrous materials having a carbon content of less than 0.4% to improve wear and corrosion resistance, said process comprising annealing said ferrous material in the presence of a case-hardening powder containing a vanadium yielder, a chromium yielder and an iron yielder wherein the iron to vanadium content of said case hardening powder is in the ratio of 2:3 to 1:4 and the chromium content of said powder is sufficiently greater than the vanadium content thereof to cause the formation of a continuous, hole free mixed carbide layer and wherein the total amount of vanadium and chromium present is sufficiently low to preclude the formation of a carbon-free mixed crystal layer between the ferrous material and the mixed carbide layer.

4,099,994

HIGH DUTY DUCTILE CASE IRON AND ITS HEAT TREATMENT METHOD

Katsuya Ikawa, and Yuichi Tanaka, both of Muroran, Japan, assignors to Riken Piston Ring Industrial Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 678,480, Apr. 20, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,800
Claims priority, application Japan, Apr. 22, 1975, 50-48767
Int. Cl.² C21D *5/00*
U.S. Cl. 148—35 **3 Claims**



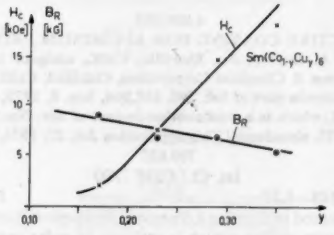
1. A ductile cast iron having a tensile strength of at least 72 kg/mm² and an elongation of at least 7%, consisting essentially of 3.0 - 4.0% C, 1.5 - 2.5% Si, less than 1.0% Mn, no more than 0.1% P, no more than 0.02% S and the balance Fe, and further having a microstructure wherein the graphite nodules are deposited in a matrix structure of finely mixed ferrite and pearlite grains of a size less than 10 microns, said microstructure being obtained by cooling the ductile cast iron of said chemical composition from a temperature range between 780° and 810° C in which a ferrite, austenite, and graphite coexisting structure is formed.

4,099,995

COPPER-HARDENED PERMANENT-MAGNET ALLOY

Anton Menth, Nussbaumen; Hartmut Nagel, Baden, and Antony James Perry, Nussbaumen, all of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Continuation of Ser. No. 598,588, Jul. 24, 1975, abandoned. This application Jun. 14, 1977, Ser. No. 806,336
Claims priority, application Switzerland, Jul. 31, 1974, 10559/74
Int. Cl.² H01F *1/02*
U.S. Cl. 148—101 **9 Claims**



1. A coarse-grained, copper-hardened permanent-magnet alloy having the formula

$$Sm(Co_{1-y}Cu_y)_{6+x}$$

wherein

$0 \leqq x \leqq 1$, and

$0.15 < y < 0.35$,

which is prepared by a process which comprises melting to-

gether the mixed components cobalt, copper, and samarium in weight proportions according to the final desired formula:

holding the melt at a temperature of about 1400° C for from 3 to 5 minutes: and

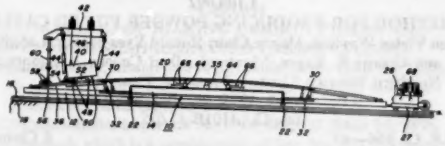
subsequently solidifying the melt in situ by applying a cooling rate of less than 50° C/min. within the solidification temperature range of between 1300° C and 1200° C.

4,099,996

PROCESS FOR HEAT-TREATING THE HEAD OF RAILROAD RAIL

John Toleikis, Jr., Whiting, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 31, 1977, Ser. No. 801,489
Int. Cl.² C21D *1/78*
U.S. Cl. 148—131 **3 Claims**



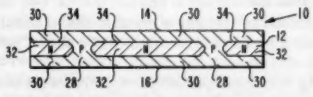
1. In the process for heat-treating a railroad rail having a head, web and flange wherein the rail is bent within the elastic limit in the plane of the web to form an arc having a predetermined height so that the head is convex and the flange concave, and the head of the rail is heat-treated progressively from one end to the other while holding the rail in such an arcuate condition, said heat treatment involving heating the rail head into the austenitic temperature range followed by a mild quench to form pearlite, the improvement comprising holding the rail in such predetermined arcuate condition while about 10% of the rail head length is heated, thereafter decreasing the height of the arc about 14% while said heat-treatment is continued until about 40% of the rail head has been heated, thereafter increasing the height of the arc to approximately its original height while said heat-treatment is continued until about 60% of the rail head has been heated, thereafter again decreasing the height of the arc about 14% while said heat-treatment is continued until about 90% of the rail head has been heated, thereafter again increasing the height of the arc to approximately its original height while said heat-treatment is continued to the end of the rail, each of said lower and raising of the arc height being effected during a period of at least 45 seconds.

4,099,997

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE

Wojciech Rosnowski, Summit, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,480
Int. Cl.² H01L *21/225, 21/223*
U.S. Cl. 148—187 **14 Claims**



1. A method of fabricating a semiconductor device comprising the steps of:

forming a source of first impurities of one conductivity determining type on each of two major opposing surfaces of a semiconductor wafer, said wafer containing opposite type determining impurities;

disposing a layer of masking material over said source of first impurities;

defining said layer and said source of first impurities to expose preselected portions of said surfaces;

exposing said wafer to a source of second impurities of said one conductivity determining type in such a manner that said second impurities diffuse into said wafer through said preselected portions, said first impurities simultaneously penetrating said unexposed portions of said wafer, said second impurities being masked from the unexposed portions of said surfaces by said source of first impurities and said masking layer, said second impurities having a comparatively higher diffusivity in said wafer than said first impurities; and thereafter

removing said masking layer and said source of first impurities; and thereafter

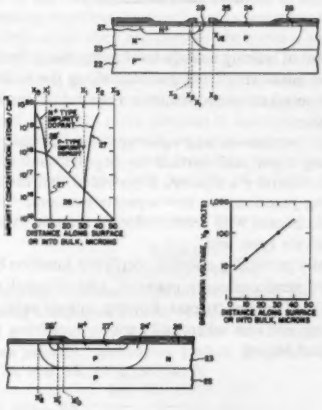
heating said wafer to a temperature at which said first impurities and said second impurities further penetrate said wafer for a time long enough so that said second impurities form first continuous regions between said two opposing surfaces.

4,099,998

METHOD OF MAKING ZENER DIODES WITH SELECTIVELY VARIABLE BREAKDOWN VOLTAGES

Armand P. Ferro, Schenectady, N.Y., and Bruno F. Kurz, deceased, late of Schnectady, N.Y. by Elizabeth Kurz-Beerli, also known as Elizabeth Kurz Chinoy, executrix, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 628,376, Nov. 3, 1975. This application Aug. 20, 1976, Ser. No. 716,090
Int. Cl.² H01L *21/22, 21/66*
U.S. Cl. 148—187 **4 Claims**



1. A method of making a semiconductor device characterized by a selectively variable breakdown voltage ranging from a few volts to several hundred volts, said method comprising:

diffusing into a substrate a first impurity-doped region of a conductivity-type different from that of said substrate, said first region having a surface-adjacent portion of substantially constant impurity concentration and a gradient region of decreasing impurity concentration extending laterally from said surface-adjacent portion;

diffusing into said substrate a second region of the same conductivity type as said substrate but of higher impurity concentration, said second region intersecting a surface-adjacent portion of said gradient region to form a P-N junction at the intersection of the edge of said second region with said gradient region; and

selecting the location of the intersection between the edge of said second region and the surface-adjacent portion of said

gradient region to provide a specific breakdown voltage, V_B, which varies with the location of the P-N junction at the surface of the substrate relative to the impurity concentration in the gradient region in accord-with the following equation for linearly graded junctions:

$$V_B \simeq 60(E_g/1.1)^{6/5}(a/3 \times 10^{20})^{-2/3} \text{ volts,}$$

where

E_g is the energy bandgap in electron volts and

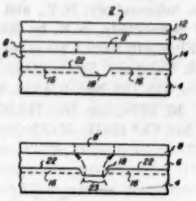
a is the impurity gradient in cm^{-4}.

4,099,999

METHOD OF MAKING ETCHED-STRIPED SUBSTRATE PLANAR LASER

Robert D. Burnham, Los Altos Hills, and Donald R. Scifres, Los Altos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 13, 1977, Ser. No. 805,661
Int. Cl.[2] H01L *21/20, 21/74;* H01S *3/06*
U.S. Cl. 148—187 **2 Claims**



1. A method of making a diode laser comprising the steps of:

forming an initial rectifying junction along the surface of a body of substrate semiconductor material of one conductivity type,

removing a portion of said substrate material, said portion extending from said surface to beyond said rectifying junction whereby a channel is provided that divides said rectifying junction into two separate portions,

filling said channel with semiconductor material of said one conductivity type, and

subsequently providing another rectifying junction between layers of semiconductor material, said channel defining the path of pump current flowing across said another rectifying junction when said another rectifying junction is forward biased.

4,100,000

PRILLED EXPLOSIVE COMPOSITION

Thomas S. Sterling, Ottawa; Jean-Yves Belanger, Ste. Foy, and Kenneth S. Kalman, Dollard des Ormeaux, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Oct. 26, 1976, Ser. No. 735,339
Claims priority, application Canada, May 31, 1976, 253728
Int. Cl.[2] C06B *45/36*
U.S. Cl. 149—4 **14 Claims**

1. A free-flowing, high-density, water-resistant explosive composition, comprising 35–80% by weight trinitrotoluene, 10–30% by weight aluminum and 0–45% by weight cyclonite, in spheroidal prill form.

4,100,001

THERMALLY CRYSTALLIZABLE GLASSES AND GLASS-CERAMICS MADE THEREFROM

Earl W. Franklin, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 15, 1977, Ser. No. 788,066
Int. Cl.[2] C03C *3/22, 3/04*
U.S. Cl. 106—39.7 **5 Claims**

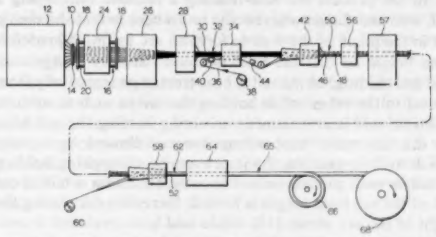
1. A thermally crystallizable glass composition consisting essentially of SiO_2, Al_2O_3, Li_2O and the nucleants TiO_2 and ZrO_2, said compositions (1) containing 18.2–20.3 parts Al_2O_3 per 100 parts by weight of $SiO_2+Al_2O_3+Li_2O$ (2) having Li_2O present in a ratio of from 0.55 to 0.63 moles for each mole of Al_2O_3 present and (3) containing 2.8–5 weight percent (TiO_2+ZrO_2) based on the total composition, including 1–2 weight percent TiO_2 and 1.2–3 weight percent ZrO_2.

4,100,002

METHOD FOR PRODUCING POWDER FILLED CABLE

Leo Victor Woytiuk, Pointe Clair; Ronald Yves Mayer, LaSalle, and George B. Kepes, Montreal, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 1, 1975, Ser. No. 564,070
Int. Cl.[2] H01B *13/06*
U.S. Cl. 156—48 **8 Claims**



1. In a method of continuously producing an electric cable having a plurality of conductors forming a stranded core enclosed in a sheath or jacket, the voids within the sheath or jacket being at least partially filled with powder, the sequential steps of:

maintaining the conductors in spaced lateral relationship over a predetermined length of travel;

applying a coating of oil to the laterally spaced conductors;

applying powder electrostatically to the separated conductors; and

bringing the powdered conductors together to form said core.

4,100,003

METHOD OF AND APPARATUS FOR PREFORMING METAL OVERLAP EDGE WITH OVERLAP DIE

Kenneth Paul Trusch, Phoenix, Ariz., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 20, 1976, Ser. No. 733,977
Int. Cl.[2] H01B *13/26*
U.S. Cl. 156—54 **8 Claims**

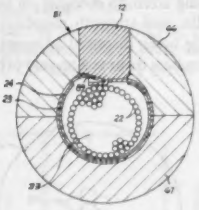
1. A method of forming a metallic shield about a cable core to provide a preformed overlap of the shield, which includes the steps of,

forming the shield partially about the cable core,

passing the partially formed shield and cable core through an overlap and forming die to form the shield about the cable core and to provide the shield with a substantially circular configuration with the longitudinal edge portions of the shield forming an overlap, while at the same time,

guiding the longitudinal edge portions of the shield to cause at least a portion of the overlying longitudinal edge por-

tion of the shield at the overlap to be turned inwardly toward the cable core a distance sufficiently to preclude



the edge portion of the shield from protruding into a subsequently extruded jacket over the formed shield.

4,100,004

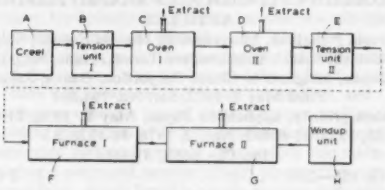
METHOD OF MAKING CARBON FIBERS AND RESIN-IMPREGNATED CARBON FIBERS

Maurice Moss, Mougins, France; Colin Barry Hill, and Michael Roger Rowland, both of Wilmslow, England, assignors to Securicum S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 685,427, May 11, 1976, abandoned, which is a continuation of Ser. No. 471,279, May 20, 1974, abandoned. This application Feb. 24, 1977, Ser. No. 771,740

Int. Cl.[2] B32B *31/18;* **D01F** *9/22*

U.S. Cl. 156—60 **17 Claims**



1. A method of making carbon fibre, comprising passing a multifilament commercial heavy tow of fibres formed of an acrylonitrile polymer or copolymer through an initial heating stage at a temperature in the range of from 100° to 160° C whilst holding it under sufficient tension to remove crimp and to stretch the fibres by up to 75%; passing the thus heated and stretched multifilament heavy tow through a pre-heat zone maintained at a temperature at least 100° C below the critical temperature of the fibres; passing the thus pre-heated multifilament heavy tow through an oxygenation zone comprising at least two stages, a first stage in which the multifilament heavy tow is contacted with an oxygenation medium selected from the group consisting of oxygen and oxygen-containing gases, gradually heated up to a first temperature in the range of from 220° to 250° C, at which the fibres are able to take up oxygen without degradation and maintained at that temperature, and a second stage in which the partly oxygenated multifilament heavy tow of fibres is further heated in the presence of an oxygenation medium to a second higher temperature, in the range of from 260° to 300° C, and is maintained at that second temperature, the multifilament heavy tow of fibres passing straight through each stage of the oxygenation zone without a change in direction within either of such stages, the fibres being held under sufficient uniform tension within the oxygenation zone to stretch the fibres by at least 50% during heating and oxygenation; and thereafter passing the multifilament tow of oxygenated fibres through a carbonizing zone comprising at least one stage in which the multifilament heavy tow of fibres is heated to a third elevated temperature in the range of from 1050° to 1600° C under non-oxidizing conditions to yield a fibre with a mean Young's modulus of at least 25×10^6 p.s.i. and a mean tensile strength of at least 250,000 p.s.i.

4,100,005

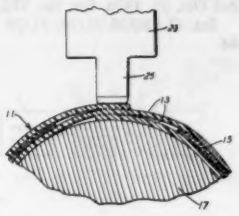
METHOD OF MAKING A DYNAMOELECTRIC MACHINE INSULATOR

Walter P. McNeal, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 333,786, Feb. 20, 1973, Pat. No. 3,880,194. This application Dec. 23, 1974, Ser. No. 536,946

Int. Cl.[2] B29C *27/08;* **B29D** *23/10;* **B32B** *31/00*

U.S. Cl. 156—73.1 **14 Claims**



1. A method of assembling together at least a portion of one strip of electrically insulating material and at least one other segment of electrically insulating material to form electric motor insulators of the type having at least one first elongate insulation piece for placement in an axially extending slot of a motor core, and having spaced apart insulation pieces for placement between the end turn portions of different phase windings supported on the motor core with the spaced apart insulation pieces interconnected by the at least one first elongate insulation piece, the method comprising the steps of: moving the strip in a longitudinal direction; overlapping a first portion of the strip and the other segment of insulating material; welding together the overlapped segment and first portion of the strip while they are disposed between a support and an energized welding tool; and subsequently severing the strip material along a line transverse to the longitudinal extent thereof so as to form a discrete insulator having at least one elongated insulation piece that can be accommodated in a core slot, and spaced apart insulation pieces connected together by the at least one first elongate insulation piece that can each be disposed between end turn portions of at least two different windings.

4,100,006

CARD-CLOTHING

John Buckley, Oldham, England, assignor to The English Card Clothing Company Limited, Huddersfield, England

Filed Mar. 24, 1977, Ser. No. 780,902

Claims priority, application United Kingdom, Apr. 6, 1976, 13798/76; Sep. 18, 1976, 38754/76

Int. Cl.[2] B32B *5/20*

U.S. Cl. 156—78 **7 Claims**

1. A method of manufacturing flexible card-clothing for use in textile carding comprising the steps of:

mechanically introducing air into a polyvinylchloride (p.v.c.) compound, which is in a plastisol form, in a continuous foam mixer to produce a foamed compound having a density of between 0.6 and 1.00 grams per cubic centimeter; applying a sealing coat of a material which is compatible with said foamed compound to a fabric layer; applying a layer of said foamed p.v.c. onto said sealing coat to produce a finished foam layer of between 2 and 5 millimeters thickness on said fabric, said sealing coat being adequate to prevent substantial penetration of said fabric layer by said foamed material; heating said applied foamed layer of p.v.c. to cause said foamed layer to fuse; applying a surface layer of sealing material to the exposed surface of said foamed layer to provide a smooth non-absorbent external surface therein, said fabric, foamed p.v.c. and said surface layer together forming a composite foundation

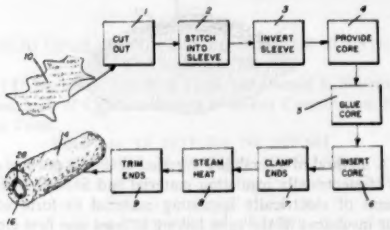
face; combining said foundation face with a foundation back to form a laminated foundation and then inserting card-clothing wires into said foundation so that parts of said wires project from the smooth external surface of said surface layer.

4,100,007

METHOD OF MAKING PAINT ROLLER COVER

Gerald D. Van Zeeland, New Berlin, Wis., assignor to E Z Paintr, Milwaukee, Wis.

Filed Oct. 15, 1976, Ser. No. 732,713
Int. Cl.[2] B32B *31/16, 31/26*
U.S. Cl. 156—86 **6 Claims**



1. A method of fabricating a paint roller cover or similar applicator fabricated partially from animal pelt, comprising the steps of:

forming a tubular sleeve of predetermined diameter of said animal pelt;

providing an internal core smaller than said predetermined diameter about which said sleeve is adapted to be embraced;

applying adhesive to the exterior of said core to facilitate adherence between the sleeve and the core, said sleeve being sufficiently larger than the outside diameter of said core so as not to displace or render uneven the layer of adhesive on the outside of the core;

mounting said core within said tubular sleeve and clamping the sleeve to the ends of the internal core to prevent longitudinal shrinking of the sleeve relative to the core; and

heat shrinking said sleeve onto said core by placing said internal core with said sleeve embraced thereabout into a steam heating chamber to shrink the animal pelt to provide a roller having a denser pile and a substantially harder sleeve in adherence with the internal core.

4,100,008

METHOD OF FORMING AN OPTICAL WAVEGUIDE CABLE

Stewart A. Claypoole, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

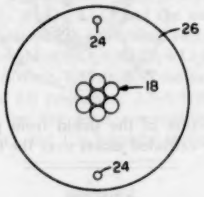
Division of Ser. No. 593,285, Jul. 7, 1975, Pat. No. 4,037,922.
This application Mar. 16, 1977, Ser. No. 778,022
Int. Cl.[2] B32B *17/04, 27/12*
U.S. Cl. 156—180 **17 Claims**

1. A method of forming a substantially circular optical waveguide cable comprising

providing a plurality of optical waveguide fibers,

disposing said fibers in a substantially contiguous relationship to one another to form a single concentrically arranged fiber bundle,

disposing at least two strength members parallel to said single bundle in a plane substantially along a diameter of said single bundle through the longitudinal axis of said bundle, at least one of said strength members being disposed in said plane on each side of said single bundle, the remainder of said strength members being disposed in said plane on either or both sides of said single bundle, each strength member on one side of said single bundle being disposed at a distance from said longitudinal axis of said bundle substantially equal to the distance therefrom of the corresponding strength member on said other side of said single bundle, said strength members on one side of said single bundle being disposed adjacent each other and said strength members disposed on said other side of said single



bundle being disposed adjacent each other when a plurality of strength members are disposed on either or both of said sides, and

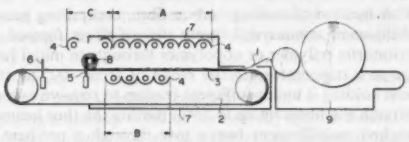
applying an encapsulating coating of at least one layer surrounding said single bundle of fibers in such manner that said strength members and said single bundle are embedded in said encapsulating coating.

4,100,009

METHOD OF AND APPARATUS FOR PRODUCING HOLLOW-CYLINDRICALLY SHAPED FIBROUS ARTICLES

Takayoshi Nakajima, Moriyamashi; Hiroshi Sonoda, Shigaken; Katsutoshi Sasaki, Shigaken, and Teruaki Hane, Shigaken, all of Japan, assignors to Chisso Corportion, Osaka, Japan

Filed May 6, 1977, Ser. No. 794,697
Claims priority, application Japan, May 8, 1976, 51-52323; May 25, 1976, 51-60499; Nov. 2, 1976, 51-132028
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—184 **9 Claims**

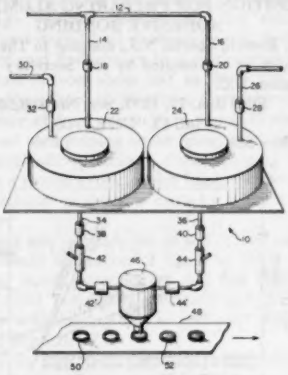


1. A process for producing a hollow-cylindrically shaped fibrous articles stabilized by hot melt adhesion which comprises passing a web of gathered fiber layer having a fixed width, carried on a conveyer belt through a heating zone, heating said web of gathered fiber layer in such a way that a lower-melting component of composite fiber contained in the lower part of said web contacting the conveyer belt is in the state close to its melting point but not in the molten state and a lower-melting component contained in the upper part of said web is in the molten state, while separating said web from the conveyer belt, winding up said web on a take-up rod in such a way that the upper surface thereof occupies the inner side of the winding, further heating, during the course of winding, the lower part of the web having been contacted with the surface of the conveyer belt which is exposed to the air after the separation, adjusting the vacant space proportion during the course of the above-mentioned steps or after completion of winding, cooling the wound up article after the adjustment of the vacant space proportion of final winding, and drawing out the take-up rod from the shaped product, said web of gathered fiber layer containing at least 10% hot-melt-adhesive composite fiber consisting of a lower-melting component, and a higher-melting component.

4,100,010
METHOD FOR MAKING DECORATIVE EMBLEMS

Robert E. Waugh, Columbus, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio

Continuation-in-part of Ser. No. 478,789, Jun. 12, 1974, abandoned. This application Jul. 2, 1976, Ser. No. 702,194
Int. Cl.[2] B29C *13/00, 21/00*
U.S. Cl. 156—242 10 Claims



1. A method of forming foil-backed inserts in the form of cast decorative emblems, comprising:

a. providing a series of flat decorative foil shapes onto which a clear, hard plastic composition suitable as a substitute for vitreous enamel is to be cast,
said foil shapes each having a top and bottom surface,
said foil shapes also having sharply defined peripheral sides which intersect with said top surface, and
having an adhesive coated on said bottom surface,

b. holding said series of foil shapes flat and horizontal on a supported surface free from surrounding side walls,

c. casting a measured amount of said plastic composition in liquid form, which liquid is poorly wetting with respect to the top surface of said foil shapes, directly onto the top surface of each of said foil shapes so that it flows to said sharply defined peripheral sides and forms a positive meniscus without flowing over said sharply defined peripheral sides,

d. allowing said cast plastic composition to cure while maintaining said foil shapes flat and horizontal, whereby said cured plastic composition gives a lens effect to the top surface of said foil shapes onto which it has been cast, and

e. utilizing said adhesive coated bottom surface of said foil shapes to adhere said inserts onto their intended base.

4,100,011
PRODUCTION OF LAMINATED CARD WITH PRINTED MAGNETICALLY ENCODABLE STRIPE

Francis C. Foote, Huntsburg, Ohio, assignor to Addressograph Multigraph Corp., Cleveland, Ohio

Continuation-in-part of Ser. No. 601,366, Aug. 4, 1975, abandoned. This application Apr. 21, 1977, Ser. No. 789,668
Int. Cl.[2] B29C *27/02;* B32B *31/26*
U.S. Cl. 156—272 7 Claims

1. A method for making a magnetically encodable article comprising the steps of:

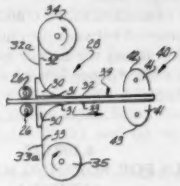
advancing a relatively rigid core stock layer in a path through a work station;

feeding a flexible, non-porous surface laminate sheet from a roll supply source into engagement with the core stock layer;

providing a vacuum shoe intermediate the roll supply source and the core stock layer for maintaining a partial vacuum at the interface of the surface laminate sheet and the core stock layer whereby movement of the surface laminate sheet over and in contact with the vacuum shoe causes the surface laminate sheet to adhere to the core stock layer by means of static electricity;

tacking the surface laminate sheet to the core stock layer subsequent to adherence of the surface laminate sheet to the core stock layer while the core stock layer is being advanced in the path;

applying a magnetically encodable medium directly to a predetermined area on the surface laminate sheet subsequent to tacking of the surface laminate sheet to the core stock layer; and



laminating the surface laminate sheet to the core stock layer;

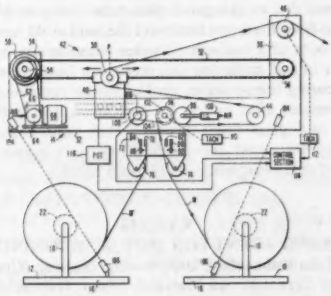
said tacking step comprising advancing the core stock layer and the surface laminate sheet past a radiation source positioned adjacent the path while directing radiant energy along narrow areas on the core stock layer and the surface laminate sheet extending transverse to the core stock layer,

whereby the surface laminate sheet is adhered to the core stock layer at points of contact therewith impinged upon by the radiant energy.

4,100,012
DRIVEN NIP ROLL SPLICER

Edward F. Meihofer, Norfolk; George F. Corcoran, Wellesley, and John W. Clifford, Ashland, all of Mass., assignors to Butler Automatic, Inc., Canton, Mass.

Filed Nov. 8, 1976, Ser. No. 739,794
Int. Cl.[2] B65H *19/14, 25/00*
U.S. Cl. 156—351 14 Claims



1. A splicer of the type including a roll stand, a splicing station and a festoon including adjacent fixed rollers, a dancer and a track permitting the dancer to be movable toward and away from the fixed rollers, said festoon being downstream from the splicing station, the improvement comprising

A. a pair of nip rolls between the splicing station and the festoon,

B. a motor connected to drive the nip rolls to feed the web from the roll stand into the festoon,

C. means for monitoring web speed into the festoon to produce a first signal,

D. means for monitoring web speed out of the festoon to produce a line speed signal,

E. means for monitoring excursions of the festoon dancer from a selected reference position to produce a web velocity trim signal,

F. means for processing said signals to develop a command signal for said motor that causes said motor to controlledly vary the torque applied to the nip rolls so as to maintain substantially constant tension in the web downstream from the rolls, and

G. means for biasing the dancer away from the fixed rollers including

i. a controllable variable slip clutch having an input shaft and an output shaft,

ii. a motor connected to the clutch input shaft, and

iii. means coupled between the clutch output shaft and the dancer for urging the dancer away from the fixed rollers with a force dependent upon the amount of slippage in the clutch.

4,100,013

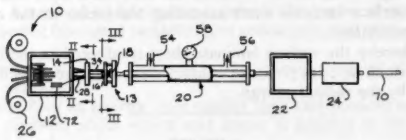
APPARATUS FOR FORMING RESIN EMBEDDED ANTENNA

Albert S. Medler, and Donald L. Myers, both of Jackson, Mich., assignors to Plastigage Corporation, Jackson, Mich.

Filed Aug. 5, 1976, Ser. No. 711,992

Int. Cl.[2] B29D *3/02*

U.S. Cl. 156—441 **3 Claims**



1. Apparatus for producing a smooth glass fiber reinforced elongated member in a continuous operation comprising, in combination, glass fiber filament dispensing means, means for impregnating said filaments with a hardenable resin, means for forming said filaments into a plurality of bundles, a cylindrical gathering die having a bore and an axis, means for feeding said bundles into said die equidistantly located about said bore and axis of said die, an elongated glass tube curing mold receiving said glass fiber filaments from said die, said mold having a glass smooth bore of a uniform diameter substantially equal to the diameter of said gathering die, means for heating said mold to a resin curing temperature, cooling means receiving said glass fiber elements after curing by said mold, and pulling means pulling said glass fibers through said impregnating means, gathering die, mold and cooling means at a rate to permit curing of said resin while within said mold.

4,100,014

ETCHING AGENT FOR III/V SEMICONDUCTORS

Franz Kuhn-Kuhnenfeld, Burghausen; Dietmar Kirsten, Tann, both of Germany, and Marianne Maier, Ostermiething, Austria, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mgH, Burghausen, Germany

Filed Apr. 6, 1977, Ser. No. 785,138

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638302

Int. Cl.[2] H01L *21/306*

U.S. Cl. 156—647 **14 Claims**

10. An improved method for producing etch pits to expose dislocations on the surface of Ga As_x P_{1-x} semiconductors, wherein x is in the range between 0 and 1, comprising the step of:

treating the surface of said semiconductors with a polishing dislocation etchant consisting of

(a) 1 to 30 percent by weight of hydrofluoric acid;

(b) 2 to 30 percent by weight of hydrogen peroxide;

(c) 1 to 75 percent by weight of sulfuric acid;

(d) 15 to 95 percent by weight of water; wherein the quantities by weight of the individual components are so chosen that they will add up to 100 percent by weight.

4,100,015

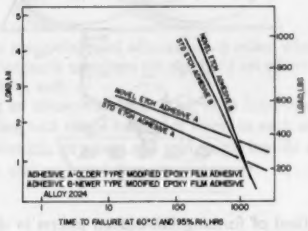
CHROMATE-FREE ETCHING PROCESS AND COMPOSITION FOR PREPARING ALUMINUM FOR ADHESIVE BONDING

William J. Russell, Sparta, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 21, 1977, Ser. No. 808,504

Int. Cl.[2] C23F *1/00*

U.S. Cl. 156—665 **6 Claims**



1. The method of adhesive bonding of aluminum parts, wherein the aluminum parts are subjected, prior to adhesive bonding, to an etching process to produce a surface preparatory to adhesive bonding, which comprises contacting the aluminum part with a chromate-free etching composition consisting essentially of:

1 to 25 weight percent nitric acid 0 to 10 weight percent sulfuric acid

5 to 8 weight percent alkali metal sulfate

0.2 weight percent to saturated solution of ferric sulfate

60 to 93 weight percent water

4,100,016

SOLVENT PULPING PROCESS

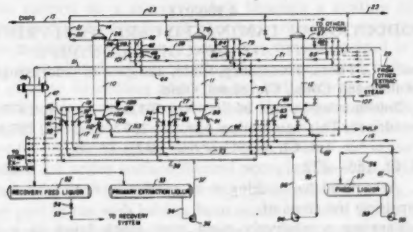
Vincent B. Diebold, Cincinnati, Ohio; Wavell F. Cowan, Montreal, Canada, and John K. Walsh, Cincinnati, Ohio, assignors to C P Associates Limited, Montreal, Canada

Filed Sep. 17, 1976, Ser. No. 724,387

Claims priority, application Canada, Oct. 24, 1975, 238294

Int. Cl.[2] D21C *3/20*

U.S. Cl. 162—16 **16 Claims**



1. In a solvent extraction pulping process wherein lignin is extracted from subdivided fibrous plant material by contacting said material at an elevated pulping temperature and pressure with a solvent pulping liquor comprising an aqueous solution of a lower aliphatic alcohol, the improvement which comprises providing a plurality of batch extractors and carrying out the following sequential steps in each extractor:

(a) feeding a first charge of said subdivided fibrous plant material to a first extractor;

(b) filling said first extractor with a first used pulping liquor so as to displace air from said first extractor;

(c) introducing a second used pulping liquor of relatively high dissolved solids content at an elevated temperature and pressure into said first extractor so as to displace said first used pulping liquor, and recirculating said second used pulping liquor without separation of lignin at a relatively high velocity through said first extractor and through an external heat exchanger so as to effect rapid heating of said first charge to a predetermined pulping temperature of from about 160° to about 220° C. within not more than about 10 minutes at a predetermined pulping pressure of from about 10 to about 50 atmospheres, said second used pulping liquor being obtained from step (e), as hereinafter described, during pulping of another charge in a second extractor and being supplied from said second extractor to said first extractor without separation of lignin;

(d) continuing said recirculation of said second used pulping liquor without separation of lignin to effect essentially isothermal initial extraction of said first charge at said predetermined pulping temperature and pressure, and thereafter withdrawing said second used pulping liquor from said first extractor;

(e) flowing at least one additional used pulping liquor through said first charge in said first extractor on a once-through basis to effect essentially isothermal further extraction of said first charge at said predetermined pulping temperature and pressure, said additional used pulping liquor having a lower dissolved solids content than said second used pulping liquor and being obtained from step (f), as hereinafter described, during pulping of still another charge in a third extractor and being supplied from said third extractor to said first extractor without separation of lignin;

(f) flowing heated fresh pulping liquor through said first charge in said first extractor on a once-through basis to effect essentially isothermal final extraction of said first charge; and

(g) discharging crude cellulose pulp from said first extractor.

9. In a solvent extraction pulping process wherein lignin is extracted from subdivided fibrous plant material by contacting said material at an elevated pulping temperature and pressure with a solvent pulping liquor comprising an aqueous solution of a lower aliphatic alcohol, the improvement which comprises providing a plurality of batch extractors and carrying out the following sequential steps in each extractor:

(a) feeding a first charge of said subdivided fibrous plant material to a first extractor;

(b) filling said first extractor with a first used pulping liquor so as to displace air from said first extractor;

(c) introducing a second used pulping liquor of relatively high dissolved solids content at an elevated temperature and pressure into said first extractor so as to displace said first used pulping liquor, and recirculating said second used pulping liquor without separation of lignin at a relatively high velocity through said first extractor and through an external heat exchanger so as to effect rapid heating of said first charge to a predetermined pulping temperature of from about 160° to about 220° C. within not more than about 10 minutes at a predetermined pulping pressure of from about 10 to about 50 atmospheres, said second used pulping liquor being obtained from step (e), as hereinafter described, during pulping of another charge in a second extractor and being supplied from said second extractor to said first extractor without separation of lignin;

(d) continuing said recirculation of said second used pulping liquor without separation of lignin to effect essentially isothermal initial extraction of said first charge at said predetermined pulping temperature and pressure, and thereafter withdrawing said second used pulping liquor from said first extractor;

(e) flowing at least one additional used pulping liquor through said first charge in said first extractor on a once-through basis to effect essentially isothermal further extraction of said first charge at said predetermined pulping temperature and pressure, said additional used pulping liquor having a lower dissolved solids content than said second used pulping liquor and being obtained from step (f), as hereinafter described, during pulping of still another charge in a third extractor and being supplied from said third extractor to said first extractor without separation of lignin;

(f) flowing heated fresh pulping liquor through said first charge in said first extractor on a once-through basis to effect essentially isothermal final extraction of said first charge, said fresh pulping liquor being obtained at least in part, from steps (g), (h), (k), and (l), as hereinafter described;

(g) draining liquor from said first extractor, depressurizing said first extractor by releasing the solvent vapors therein to a condenser, and recovering condensed solvent suitable for reuse as said fresh pulping liquor in step (f);

(h) passing steam through said first extractor to strip residual solvent from said first charge, and condensing the stripped solvent vapors to obtain a condensate suitable for reuse as said fresh pulping liquor in step (f);

(i) discharging crude cellulose pulp from said first extractor;

(j) subjecting said second used pulping liquor withdrawn in step (d) at said predetermined pulping temperature and pressure to depressurization, and separating the resultant solvent vapors from residual used pulping liquor;

(k) condensing the solvent vapors from step (j) to obtain a condensate suitable for reuse as said fresh pulping liquor in step (f); and

(l) steam stripping at least a portion of said residual used pulping liquor from step (j) at subatmospheric pressure, removing and condensing the stripped solvent vapors to obtain a condensate suitable for reuse as said fresh pulping liquor in step (f), and separating the resultant residual slurry containing lignin solids and dissolved carbohydrates.

4,100,017

MULTI-PLY TISSUE PRODUCT

Thomas Joseph Flautt, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 574,840, May 5, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,885

Int. Cl.[2] D21H *5/24*

U.S. Cl. 162—111 **13 Claims**

1. A soft, absorbent paper product comprising at least two webs of paper, at least two of which webs are dissimilar, wherein at least one of said dissimilar webs is produced by a conventional papermaking process and has a random crepe pattern and a density of from 0.150 to 0.240 gm/cc and wherein at least one of said dissimilar webs is produced by a high bulk papermaking process and has a regularly repeating crepe pattern and a density of from about 0.070 to about 0.140 gm/cc; said paper product having a bending modulus substantially lower than the average of the bending moduli of a multi-ply paper product made entirely from paper produced by said conventional papermaking process and of a multi-ply paper product made entirely from paper produced by said high bulk papermaking process.

4,100,018
METHOD AND APPARATUS FOR FORMING A FIBROUS WEB

Douglas Wahren; Erik Gunnar Stenberg, and Berndt Erik Ingvar Klerelid, all of Karlstad, Sweden, assignors to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

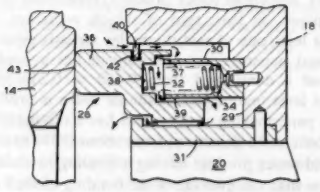
Filed Jun. 22, 1976, Ser. No. 698,538
Claims priority, application Sweden, Jun. 23, 1975, 7507159
Int. Cl.[2] D21F *1/00, 9/00*
U.S. Cl. 162—203 14 Claims

1. A method for continuously forming a running fibrous web from a fibrous suspension by injecting suspension between two running web forming wires that are pervious to the suspension liquid, forming and dewatering the injected suspension by passing the wires with the injected suspension therebetween over an arcuate segment of the impermeable surface of a forming roll while under tension, and thereafter separating the wires so that the web follows one of the wires, wherein the improvement comprises subjecting the web to further nonsuction dewatering to a dry content of about 8 - 13% at a location spaced apart from the forming roll by passing the wires and web after run-off from said forming roll and while under tension over a convexly curved surface that has a smaller radius of curvature than the forming roll and that has adjacent dewatering and wire separation portions, respectively, at least the wire separation portion being impervious, and thereafter separating the outer wire relative to said convexly curved surface from the web solely by running it off the impervious wire separation portion of said convexly curved surface in the direction away therefrom at an angle of less than 10° with respect to the inner wire while running the inner wire off the impervious wire separation portion of said convexly curved surface with the web.

4,100,019
NOZZLE SEAL

Russell Dennis Groff, Canal Fulton, and Richard John Vatovec, Akron, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 27, 1975, Ser. No. 591,255
Int. Cl.[2] G21C *15/00*
U.S. Cl. 176—50 4 Claims

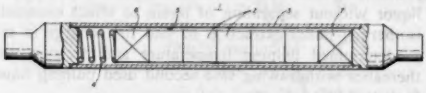


1. A reactor system comprising a pressure vessel having at least one inlet and one outlet nozzle, a distribution hoop located within the vessel, the hoop having an opening facing the outlet nozzle, an impervious means interposed between the vessel and the hoop to define a fluid flow channel extending from the opening to the outlet nozzle, said impervious means including a compression ring circumscribing the opening, the compression ring being formed with an annular recess, a spring seated in the recess, a seal ring slidably mounted on the compression ring, the spring urging the seal ring toward the vessel to maintain sealing contact therebetween, and means including at least one slidable pressure ring for precluding fluid leakage between the seal ring and said hoop.

4,100,020
INTERNAL FUEL PIN OXIDIZER

Mena G. Andrews, Newington, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 22, 1976, Ser. No. 734,910
Int. Cl.[2] G21C *3/02*
U.S. Cl. 176—68 7 Claims

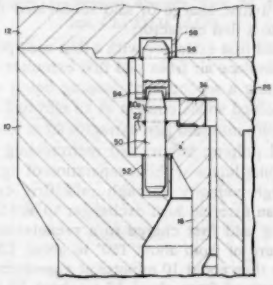


1. A nuclear reactor fuel pin, including,
a tubular cladding which is sealed,
a series of fuel pellets aligned along the internal length of the tube,
and a pellet of oxidizing chemical placed within the series of fuel pellets,
whereby the pellet of oxidizing chemical will decompose during use of the pin and produce an oxidizing material which will disperse over the length of the tubular cladding and oxidize any internal surface of the tubular cladding which may become exposed.

4,100,021
NUCLEAR REACTOR VESSEL AND INTERNALS ALIGNMENT APPARATUS

Bernard L. Silverblatt, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 18, 1976, Ser. No. 733,592
Int. Cl.[2] G21C *13/10*
U.S. Cl. 176—87 8 Claims



1. An improved nuclear reactor of the type having a reactor vessel, a reactor vessel head supported atop said vessel, a core barrel including a flange supported within said vessel, and an upper support structure supported between said core barrel flange and said head, wherein the improvement comprises:
apparatus for laterally aligning said vessel, head, flange, and support structure, said apparatus including lower keyed means for aligning said flange, support structure and ves-

sel, and upper keyed means for laterally aligning said support structure and head, said upper keyed means maintaining alignment of said support structure and head upon their simultaneous removal from said core barrel and vessel.

4,100,022

PROCESS FOR PREPARING A CURING AGENT FOR MYELOGENIC LEUKEMIA

Katsuhiro Ogasa, Yokohama; Morio Kuboyama, Tokyo; Minoru Saito, Komae, and Kazuhiro Nagata, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1976, Ser. No. 727,653

Claims priority, application Japan, Oct. 17, 1975, 50-124435

Int. Cl.² C12K *9/00*

U.S. Cl. 195—1.8 **2 Claims**

1. A process for preparing a therapeutic agent, comprising the steps of: preculturing human amnion cells isolated from the human amnion by trypsinization or human amnion cells obtained by subculturing isolated amnion cells in a medium containing calf or bovine fetal serum at least 1 time for 1 to 5 days thereby forming a monolayer of cultured cells; separating said cultured cells from the culture medium; culturing said cells in a medium containing 0.5 to 20 mg of human serum albumin per 1ml of medium thereto for 3 to 6 days; dialyzing the culture medium against a diluted buffer or water; and filtering said dialyzed culture liquid through a bacterial filter thereby obtaining a germ-free liquid agent.

4,100,023

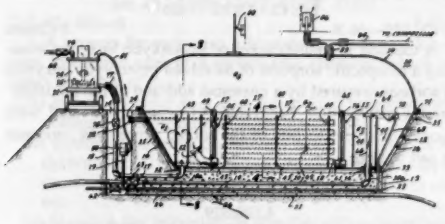
DIGESTER AND PROCESS FOR CONVERTING ORGANIC MATTER TO METHANE AND FERTILIZER

Byron A. McDonald, R.D. 2, Baraboo, Wis. 53913

Filed Apr. 8, 1977, Ser. No. 785,777

Int. Cl.² C12D *3/10*

U.S. Cl. 195—27 **11 Claims**



1. A digester for controlling the decomposition of organic matter to produce methane gas and a liquid fertilizer comprising:

first, second and third slurry chambers disposed in tandem;

a flexible chamber located above and covering said slurry chambers;

a first passthrough tube connecting said first chamber to said second chamber and disposed to pass slurry from the central level portion of said first chamber to the lower level portion of said second chamber;

a second passthrough tube connecting said second chamber to said third chamber and disposed to pass slurry from the lower level portion of said second chamber to the lower level portion of said third chamber;

an input line connected for periodically feeding a load of raw slurry into the bottom of said first chamber; and

an output line connected to the bottom of an upright pipe in said third chamber, the upper end of said upright pipe being the outlet port into which the slurry in the third chamber drains for feeding into the output line;

whereby the periodical feeding of a load of raw slurry into said first chamber results in an equal volume of slurry being automatically transferred from each chamber to the next and into the output line; and

wherein the size of the said first chamber is large enough to detain the volume of slurry received there in long enough to produce an acidified material and the size of said second chamber is large enough to detain the volume of slurry received therein from the first chamber long enough to generate methane gas which is collected in said fourth chamber.

10. A process for the producing of a methane gas and a liquid fertilizer from organic matter comprising the steps of:

blending a slurry of organic waste matter containing aerobic and anaerobic bacteria in a mix tank

providing a first, second and third chamber interconnected in tandem by passthrough tubes such that the central level portion of the first chamber is connected to the bottom level portion of the second chamber and the bottom level portion of the second chamber is connected to the bottom level portion of the third chamber, the size of the second chamber being larger than the size of either the first or third chambers;

providing a flexible gas collecting chamber above and covering first, second and third chambers;

initially filling said first, second and third chambers with slurry from said mix tank to the level of an output port provided by the upper end of an upright pipe in the third chamber; and

periodically feeding a predetermined volume of slurry less than the volume of the first chamber from the mix tank into the bottom of the first chamber and automatically creating a movement of a like volume of the slurry from said first chamber to said second chamber, from said second chamber to said third chamber; and from said third chamber into the outlet port;

wherein the size of said first chamber is large enough to detain the volume of slurry received therein from the mix tank long enough to react to aerobic bacteria and anaerobic bacteria to produce an acidified material and the size of said second chamber is large enough to detain the volume of slurry received therein from the first chamber long enough to further react to anaerobic bacteria to generate methane gas;

whereby the digested slurry received in the third chamber from the second chamber and drained down said outlet port corresponds to liquid fertilizer and permitting the slurry in the second chamber to remain long enough to generate methane gas which is collected in said fourth chamber.

4,100,024

HYDROLYSIS OF SOY PROTEIN

Jens Lorenz Adler-Nissen, Copenhagen, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Filed Jan. 12, 1977, Ser. No. 758,776

Claims priority, application United Kingdom, Jan. 19, 1976, 2042/76

Int. Cl.² A23L *1/20*

U.S. Cl. 195—29 **7 Claims**

1. Process for the preparation of polypeptides from soy protein soluble in aqueous media at pH's in the range of from 2 to 7 which are suitable for use as an additive for low protein acid food products, which process comprises hydrolyzing soy protein with a microbial, alkaline proteinase in concentration ranging from 4 to 25 Anson units per kg of soy protein at a substrate concentration of between 5 and 20% w/w soy protein, at a pH in the range of from 7.5 to 8.5, until a degree of hydrolysis in the range of from about 8 to 15%, is attained, whereafter the enzyme is inactivated by reduction of pH with a food grade acid, then recovering the supernatant from the precipitate.

4,100,025

METHOD OF TREATING A DEXTROSE SOLUTION

Shigehiro Enokizono, Ageo; Norio Kamata, Funabashi, and Sakado Kanno, Sakada, all of Japan, assignors to CPC International Inc., Englewood Cliffs, N.J.

The portion of the term of this patent subsequent to July 11, 1995 has been disclaimed.

Filed Sep. 30, 1975, Ser. No. 618,090

Claims priority, application Japan, Oct. 4, 1974, 49-113998

Int. Cl.[2] C13K *1/00, 11/00;* C13D *3/14;* C12C *13/00*

U.S. Cl. 195—31 F 5 Claims

1. A method for the removal of heavy metal ions from a dextrose containing solution comprising passing said solution through a bed of a selectively adsorbing chelating resin or a selectively adsorbing complex adsorbing exchange resin capable of binding said heavy metal ions.

4,100,026

PROCESS FOR THE PREPARATION OF 4-ANDROSTENE-3,17-DIONE DERIVATIVES

Alfred Weber; Mario Kennecke; Rudolf Mueller; Ulrich Eder, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

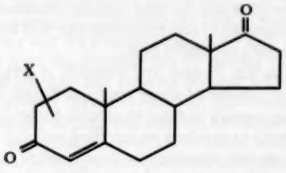
Filed Dec. 17, 1976, Ser. No. 751,677

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2558090

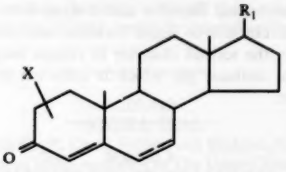
Int. Cl.[2] C07B *29/00*

U.S. Cl. 195—51 G 10 Claims

1. A process for the preparation of a 4-androstene-3,17-dione compound of the formula



wherein X is 1,2-methylene or 1- or 2-methyl, comprising fermenting, in the absence of 4-androstene-3,17-dione degradation inhibitors, a sterol of the formula



wherein X is as above, ——— is a single bond, and R_1 is a saturated or unsaturated hydrocarbon side chain of 8-10 carbon atoms, with a microorganism culture capable of degrading sterol side chains.

4,100,027

PROCESS FOR THE PREPARATION OF 4-ANDROSTENE-3,17-DIONE DERIVATIVES

Alfred Weber; Mario Kennecke; Rudolf Mueller; Ulrich Eder, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

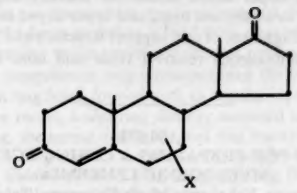
Filed Dec. 16, 1976, Ser. No. 751,687

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2558088

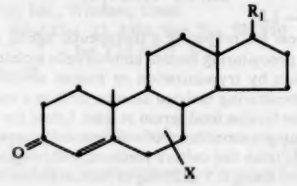
Int. Cl.[2] C07B *29/00*

U.S. Cl. 195—51 G 10 Claims

1. A process for the preparation of a 4-androstene-3,17-dione of the formula



wherein X is 6,7-methylene or 6- or 7-fluoro, chloro, or methyl, comprising fermenting, in the absence of inhibitors, a sterol of the formula



wherein X is as above and R_1 is a saturated or unsaturated sterol side chain of 8–10 carbon atoms, with a microorganism culture capable of degrading sterol side chains.

4,100,028

METHOD FOR PURIFICATION OF PROTEOLYTIC ENZYMES

Valentin Mikhailovich Stepanov, ulitsa Chertanovskaya, 33, korpus 1, kv. 247, and Galina Nikolaevna Rudenskaya, ulitsa Tsandera, 7, kv. 281, both of Moscow, U.S.S.R.

Filed Jun. 7, 1977, Ser. No. 804,248

Claims priority, application U.S.S.R., Jun. 9, 1976, 2370306

Int. Cl.[2] C07G *7/026*

U.S. Cl. 195—66 R 3 Claims

1. A method for purification of proteolytic enzymes comprising a biospecific sorption of dissolved proteolytic enzymes on a sorbent prepared by a chemical addition of the naturally-occurring polypeptide bacitracin, to agarose activated with cyanogen bromide; elution of the sorbed proteolytic enzymes with salt buffers.

4,100,029

METHOD FOR IMPROVING THE ACTIVITY OF OXIREDUCTASE ENZYMES EMBEDDED IN FILAMENTARY STRUCTURES

Giulio Prosperi, Rome; Walter Marconi, San Donato Milanese (Milan); Silvia Giovenco, Rome, and Franco Morisi, San Giovanni in Persiceto (Bologna), all of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Jul. 9, 1976, Ser. No. 703,968

Claims priority, application Italy, Jul. 10, 1975, 25251 A/75

Int. Cl.[2] C07G *7/02*

U.S. Cl. 195—68 6 Claims

1. A method for improving the activity of oxidoreductase enzymes that are formed into a filamentary structure which comprises a fibrous or filamentous structural base of a water-insoluble artifical synthetic polymeric material and an enzyme or enzymes therein englobed and subdivided and partially enclosed in separated alveoli, said method comprising the steps of forming solutions of a structural base of a water-insoluble artifical synthetic polymeric material an oxidoreductase enzyme and a coenzyme of nicotinamide-adenine-dinucleotide and a water soluble, high molecular weight polymer, forming an emulsion of said solutions and thereafter spinning said emulsion into said filamentary structure.

4,100,030

PROCESS FOR THE DETERMINATION OF AT LEAST ONE OF THE ISOENZYMES OF LACTATEDEHYDROGENASE

Walther Lamprecht, Isernhagen, Fed. Rep. of Germany, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Division of Ser. No. 723,649, Sep. 15, 1976, which is a division of Ser. No. 612,633, Sep. 12, 1975, Pat. No. 4,003,795. This application Jun. 7, 1977, Ser. No. 804,377

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1974, 2443741

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—103.5 R 7 Claims

1. A method for diagnosing pathological changes in the lower female genital tract by determining specific isoenzymes of the lactatedehydrogenase (LDH) which method comprises applying a test reagent composed of

1.0 to 150 mM of a buffer adapted to provide about a pH of 7 for the reagent prior to use

20 to 350 mM sodium salt of DL-lactic acid

0.01 - 1.0 mM phenazinemethosulfate (PMS)

0.1 - 10 mM nicotinamide-adenine-dinucleotide (NAD^+)

0.01 - 1.5 mM nitro-blue-tetrazoliumchloride (NBT)

onto a carrier adapted for insertion into the vagina, inserting said carrier in the lower female genital tract, the test reagent providing a pH between about 6 and 6.5 when in the vagina, leaving said carrier in said tract for at least 10 minutes then removing said carrier and observing the carrier for the appearance of a blue coloration indicating the presence of said enzymes, particularly of the isoenzymes 4 and 5.

4,100,031

PROCESS FOR PREPARING BLAST FURNACE COKES

Yoshio Kiritani, Osaka, and Michio Tsuyuguchi, Wakayama, both of Japan, assignors to Sumikin Coke Company Limited, Japan

Filed Jan. 4, 1977, Ser. No. 756,967

Claims priority, application Japan, Apr. 30, 1976, 51-50230

Int. Cl.[2] C10B *47/10, 53/08, 57/04*

U.S. Cl. 201—6 8 Claims

1. A process for preparing a blast furnace coke which contains low-grade coal in a carbonizing chamber which comprises the steps of

(a) adding a binder to a coal for making briquettes which contains 40% or more of a low-grade coal;

(b) forming briquettes of different shapes or weights from the binder-coal combination of step (a) to increase the bulk density and decrease segregation in the carbonizing chamber;

(c) blending the briquettes of step (b) with a charging coal such that the briquettes comprise about 35% or more of the obtained blend; and

(d) carbonizing the blend of step (c) in a carbonizing chamber to prepare the blast furnace coke.

4,100,032

PROCESS FOR CARBONIZING LIGNITE COAL

Anton J. Elberg, Dickinson, N. Dak., assignor to Husky Industries Inc., Dickinson, N. Dak.

Filed Jul. 25, 1977, Ser. No. 818,522

Int. Cl.[2] C10B *49/00, 53/00, 57/02*

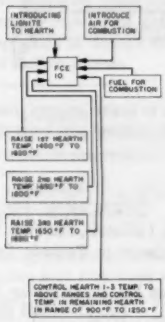
U.S. Cl. 201—27 10 Claims

1. In a multi-hearth furnace for converting lignite to produce specification char having a controlled residual volatile content wherein sufficient quantities of combustion air and supplemental fuel are introduced into the furnace to raise the temperature of the furnace and a given quantity of lignite is introduced into the furnace and is successively passed from one hearth to the next adjacent hearth until the completed char is withdrawn from the last hearth, the improvement comprising:

(a) controlling the temperatures in the first hearth in range of between approximately 1450° to 1620° F while admitting sufficient combustion air to the first hearth to assure complete combustion of volatiles driven off within at least the first hearth and in the stack and to drive off a major portion of the moisture contained in the lignite;

(b) controlling the temperature in the second hearth in the range of between approximately 1650° and 1800° F while admitting sufficient combustion air to the second hearth to assure combustion of the volatiles driven off within the second hearth and to drive off the remainder of the moisture contained in the lignite and to drive off a portion of the volatiles contained in the lignite;

(c) controlling the temperature in the third hearth in the range of between approximately 1650° and 1890° F while admitting sufficient combustion air to the third hearth to


INTRODUCING LIGNITE TO HEARTH
INTRODUCE AIR FOR COMBUSTION
FUEL FOR COMBUSTION
RAISE 1ST HEARTH TEMP. 1400 °F TO 1600 °F
RAISE 2ND HEARTH TEMP. 1650 °F TO 1800 °F
RAISE 3RD HEARTH TEMP. 1650 °F TO 1890 °F
CONTROL HEARTH 1-3 TEMP. TO ABOVE RANGES AND CONTROL TEMP. IN REMAINING HEARTH IN RANGE OF 900 °F TO 1250 °F

assure combustion of the volatiles driven off within the third hearth and to drive off a major portion of the volatiles contained in the lignite, the volatiles driven off of the lignite in the second and third hearth being burned off in the furnace in all hearths by mixing with the previously admitted combustion air so that the furnace is self-sustaining after being initially ignited and heated up by the use of the supplemental fuel; and

(d) controlling the temperature in at least one more hearth in the range of approximately 990° to 1250° F to control and drive off a predetermined portion of the volatiles in the lignite to thereby control the volatile content of the final specification char produced in the multi-hearth furnace.

4,100,033

EXTRACTION OF CHARGE GASES FROM COKE OVENS

Heinz Hölter, Beisenstrasse 39-41, Gladbeck, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 602,659, Aug. 7, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,420

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1974, 2440016; Oct. 17, 1974, 2449391; Apr. 23, 1975, 2517968

Int. Cl.[2] C10B *27/04*

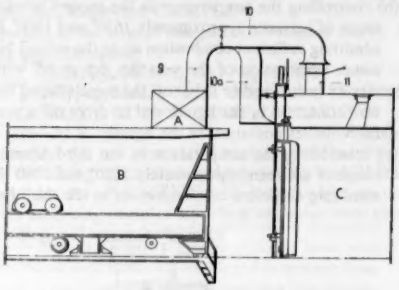
U.S. Cl. 201—27 14 Claims

14. In a method for burning, in a combustion chamber, coke-oven gases produced in a battery of successive coke ovens, the improvement which comprises, in combination:

a. mounting the combustion chamber on a movable truck,

b. passing gases from each of the successive coke ovens sequentially into said combustion chamber at a flow velocity which does not exceed 10 meters per second and for a period sufficient to burn the gases completely, and

c. providing the combustion chamber with a refractory lining means to maintain a sufficient heat level between



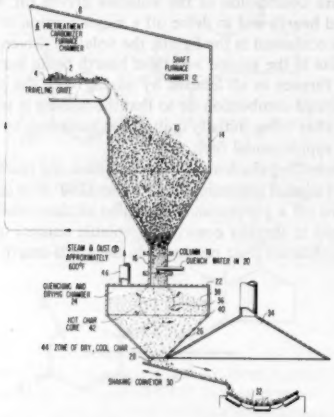
gas charges to ignite charges from successive coke ovens substantially without supplementary heating means.

4,100,034

QUENCHING METHOD

Jimmy B. Smith, Columbia, and Jack R. Haley, Nashville, both of Tenn., assignors to Peabody Coal Company, Columbia, Tenn.

Filed Jul. 19, 1976, Ser. No. 706,436
Int. Cl.² C10B *39/04*
U.S. Cl. 201—39 **2 Claims**



1. A process for quenching loose, hot char material which comprises:

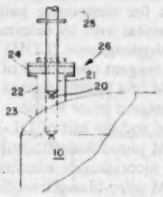
gravity feeding a column of downwardly moving hot char material in a substantially vertical pipe, collecting said material in a vessel having an outlet opening in a lower portion thereof by feeding said column of material into a top portion of said vessel, forming a pile of said material in said vessel which pile extends upwardly to and chokes the bottom of the pipe, feeding quench water into said column of material forming a hot steam drenched core portion beneath the column and extending within the vessel adjacent said top portion and exhausting steam from an upper portion of said vessel while discharging said material through said outlet opening at a rate to obtain a desired residence time of said material in said pipe and vessel so as to control the temperature and moisture content of the discharging material, whereby the material in the column and core portion is cooled and quenched by the quench water and moisture is driven off from the material in the pile by the residual heat therein.

4,100,035

APPARATUS FOR QUENCHING DELAYED COKE

George E. Smith, Stillwater, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 619,279, Oct. 3, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,643
Int. Cl.² C10B *39/06*
U.S. Cl. 202—227 **2 Claims**



1. In a delayed coking drum comprising an elongated vertically oriented coking drum having feedstock inlet means at the bottom thereof, vapor outlet means at the top thereof, steam inlet means at the bottom thereof, and coke outlet means at the bottom thereof, the improvement comprising:

retractable nozzle means extending downwardly from the top of the coking drum for introducing quench water onto the top of a bed of delayed coke therein;

protective housing means for the retractable nozzle means on the top of the coking drum whereby the nozzle means may be stored therein out of the main body of the coking drum when not in use;

means limiting the downward movement of the nozzle means whereby the nozzle means do not extend into a bed of delayed coke in the coking drum; and

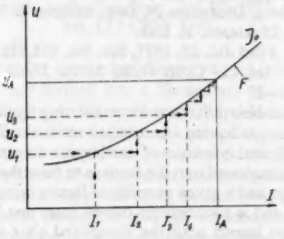
steam outlet means at the bottom of the coking drum for removal of steam formed by contact of quench water with hot coke.

4,100,036

METHOD OF REGULATING CATHODE CURRENT DENSITY IN AN ELECTROPLATING PROCESS

Ernst-Dietrich Rode, and Hans-Georg Winkler, both of Hamburg, Fed. Rep. of Germany, assignors to E.D. Rode KG, Hamburg, Fed. Rep. of Germany

Filed Feb. 9, 1977, Ser. No. 766,930
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605669
Int. Cl.² C25D *21/12*
U.S. Cl. 204—14 R **8 Claims**



1. In a method of regulating cathode current density in electroplating baths having at least one controllable power supply unit by means of which the plating current I and the

plating voltage U can be adjusted in accordance with the optimum current density J_O, for the particular electroplating bath involved, and the surface area A of the parts to be electroplated, when area A is unknown and difficult to determine, to the value U_A or I_A required to produce J_O, the method including the steps of:

selecting and introducing into the bath, several electroplatable parts which have various known and predetermined surface areas;

determining from the optimum current density J_O and the surface area of each part, the plating current values required for producing J_O for each part;

adjusting the power supply unit to the current values corresponding to each of the electroplatable parts; and

measuring the associated voltages, which arise in response to the various currents;

the improvement which comprises the steps of:

introducing the electroplatable parts in a particular sequence into the bath;

adjusting the power supply unit to the plating current values, and measuring their associated voltages in the particular sequence that the electroplatable parts were introduced into the bath;

plotting a graph F representing the plating current values in the particular sequence versus the measured values of the associated voltages, the graph F being defined by a function $U = F(I)J_O$, and having as a parameter the optimum current density J_O;

introducing into the bath an electroplatable part, having an unknown surface area A;

freely selecting an initial value of voltage U, which is relatively low as compared with the optimum voltage U_A on graph F;

adjusting the power supply unit to the voltage U_1;

determining from the graph F, the initial current I, associated with U_1;

measuring a current I_2, which is larger than the initial current I, but smaller than the optimum current I_A;

determining from the graph F, the value of the voltage U_2 associated with I_2;

adjusting the power supply unit to voltage U_2; and

continuing to measure in sequence the intermediate currents arising in response to the adjustments of the power supply unit to the intermediate voltages determined from the graph F, with increments of current and voltage becoming relatively smaller and smaller until the values of the plating voltage and current closely approach the values of U_A and I_A required to produce J_O for the electroplatable part.

4,100,037

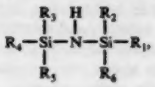
METHOD OF DEPOSITING A METAL ON A SURFACE

William James Baron, Franklin Township, Somerset County, and John Thomas Kenney, Lawrence Township, Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,610
Int. Cl.² C23C 3/02; C23B 5/64
U.S. Cl. 204—15 **45 Claims**

1. A method of depositing a metal on a surface capable of retaining a colloidal species thereon which comprises:

(a) selectively coating a portion of the surface with a colloidophobic material selected from the group of colloidophobic materials consisting of (1) a composition comprising dimethoxy polysiloxane having a viscosity ranging from 20 to 100,000 centipoise, (2) a composition comprising a polyfluoroalkyl ester, (3) a composition comprising a perfluoro epoxy resin, and (4) a composition comprising a colloidal silica having chemically bonded to the surface thereof amounts of from about 0.01 to about 30 percent by weight based on the weight of the silica of a disilizane compound having the general formula



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are like or unlike radicals selected from the group consisting of alkyl having one to five carbon atoms to render said portion collodiophobic and to delineate an exposed surface pattern capable of retaining a colloidal species thereon; and

(b) treating said selectively coated surface with a sol comprising a colloidal species selected from the group consisting of (a^1) a colloidal species capable of reducing an activating metal ion to an activating metal, and (b^1) a colloidal activating metal species capable of participating in an electroless metal deposition to deposit said colloidal species on said exposed surface pattern.

4,100,038

PLATING ON ALUMINUM ALLOYS

Jan C. Jongkind, East Detroit, Mich., assignor to M&T Chemicals Inc., Stamford, Conn.

Filed Nov. 8, 1977, Ser. No. 849,633
Int. Cl.² C25D 5/44
U.S. Cl. 204—38 B **7 Claims**

1. The process for plating aluminum and aluminum alloys which comprises contacting said aluminum with an aqueous activating bath substantially free of active copper ions containing a stannate salt selected from the group consisting of sodium stannate and potassium stannate in a concentration of 10 - 70 grams per liter of tin as stannate; at least one member of the group consisting of sodium and potassium hydroxide in a concentration of from 1.2 grams per liter to 12.0 grams per liter; and 0.01 gram per liter to 25 grams per liter of at least one member of the group consisting of methyl cellulose ethers, polyvinyl alcohols, polyethylene oxide, and polyethylene glycols; maintaining said aluminum and said aqueous bath in contact thereby activating the surface of said aluminum, withdrawing from said aqueous bath said aluminum bearing a film of said aqueous bath, immersing said aluminum bearing said film as cathode in an alkaline bronze bath containing an anode thereby depositing a strike plate on said aluminum, and establishing a negative potential on said aluminum bearing said film with respect to said anode prior to the time said aluminum is immersed in said alkaline bronze bath.

4,100,039

METHOD FOR PLATING PALLADIUM-NICKEL ALLOY

Jerome Joseph Caricchio, Jr., Binghamton, and Edward Robert York, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,901
Int. Cl.² C25D 3/56
U.S. Cl. 204—43 N **5 Claims**

1. A method for depositing a palladium-nickel alloy on a substrate, comprising the steps of:

subjecting an anode to an aqueous bath solution consisting essentially of 3 to 6 grams per liter of palladium ion derived from palladosammine chloride, about 12 grams per liter of nickel ion derived from the group consisting of nickel sulfamate, nickel chloride and nickel sulfate, from 10 to 50 grams per liter of ammonium sulfamate, ammonium sulfate or ammonium chloride, between 1 and 1000 parts per million of a sulfite ion derived from sodium sulfite and sufficient 29% ammonium hydroxide to solubilize the palladium and nickel metal ions into soluble ammonia complexes and to maintain a pH between 8.8 and 9.6;

immersing the substrate to be coated in said solution and in spaced relation to said anode;

applying a plating current density of 0.3 to 3.0 amperes per square decimeter to said solution and substrate;
agitating both said solution and substrate; and
maintaining said solution at ambient temperature and without increasing the above concentrations of ingredients in the bath during the plating process.

4,100,040

ELECTRODEPOSITION OF BRIGHT ZINC UTILIZING ALIPHATIC KETONES

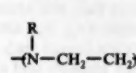
William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 735,420, Oct. 26, 1976, Pat. No. 4,059,510, which is a continuation-in-part of Ser. No. 593,310, Sep. 4, 1975, Pat. No. 3,988,219, and Ser. No. 610,251, Jul. 7, 1975, Pat. No. 4,007,098. This application Sep. 14, 1977, Ser. No. 833,034

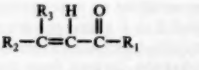
Int. Cl.[2] C25D *3/22*

U.S. Cl. 204—55 R **30 Claims**

1. A zinc brightener additive, comprising:
from about 1 percent to about 98 percent by weight of a polymeric amine selected from the class consisting of;
a linear aliphatic amine polymer prepared by reacting from about 50 percent to about 200 percent of a stoichiometric amount of an epihalohydrin selected from the class consisting of epichlorohydrin and epibromohydrin with a linear aliphatic polyamine selected from the class consisting of a compound having at least two primary amine groups, two secondary amine groups, or one primary and one secondary amine group; said amine groups separated by two through six methylene groups or alkyl substituted methylene groups;
an aminated polyepichlorohydrin prepared by reacting polyepichlorohydrin with an amine selected from the class consisting of secondary aliphatic amines and secondary alicyclic amines at a temperature of from about 110° C to about 170° C; the amount of said amines is such so that between 50 percent to 100 percent of the chloro groups in said polyepichlorohydrin is reacted;
a polyethylenimine having the formula

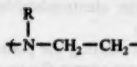


wherein R is hydrogen, methyl, ethyl, propyl, isopropyl, hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2-aminoethyl, 2-aminopropyl, and 3-aminopropyl, and *y* is about 10 to about 100, and combinations thereof;
including from 1 to 98 percent by weight of a propylene oxide-ethylene oxide block copolymer having a molecular weight of more than 500;
said block copolymer prepared by the sequential addition of propylene oxide and ethylene oxide in either order to a residue of any organic compound containing a plurality of active hydrogen atoms; and
including from about 1 to about 20 percent of aliphatic ketones having the general formula

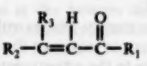


where R_1 is an alkyl group having from 1 to 4 carbon atoms or an alkenyl group having from 2 to 4 carbon atoms;
where R_2 is hydrogen or an alkyl groups having from 1 to 4 carbon atoms; and
where R_3 is an alkyl group having from 1 to 4 carbon atoms or furyl.

12. An aqueous acid zinc electroplating bath for producing a bright electrodeposition of zinc, containing zinc ions, comprising:
having dissolved therein from about 0.5 to about 10.0 grams/liter of a polymeric amine selected from the class consisting of;
a linear aliphatic amine polymer prepared by reacting from about 50 percent to about 200 percent of a stoichiometric amount of an epihalohydrin selected from the class consisting of ephichlorohydrin and epibromohydrin with a linear aliphatic polyamine selected from the class consisting of a compound having at least two primary amine groups, two secondary amine groups, or one primary and one secondary amine group; said amine groups separated by two through six methylene groups of alkyl substituted methylene groups;
an aminated polyepichlorohydrin prepared by reacting polyepichlorohydrin with an amine selected from the class consisting of secondary aliphatic amines and secondary alicyclic amines at a temperature of from about 110° C to about 170° C, the amount of said amines is such so that between 50 percent to 100 percent of the chloro groups in said polyepichlorohydrin is reacted;
a polyethylenimine having the formula



where R is hydrogen, methyl, ethyl, propyl, isopropyl, hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2-aminoethyl, 2-aminopropyl, and 3-aminopropyl, and y is about 10 to about 100, and combinations thereof;
including from 1 to about 10 grams/liter of a propylene oxide-ethylene oxide block copolymer having a molecular weight of more than 500, said block copolymer prepared by the sequential addition of propylene oxide and ethylene oxide, in either order, to a residue of any organic compound containing a plurality of active hydrogen atoms; and
from about 0.05 to about 0.5 grams/liter of an aliphatic ketone having the general formula



where R_1 is an alkyl group having from 1 to 4 carbon atoms or an alkenyl group having from 2 to 4 carbon atoms;
where R_2 is hydrogen or an alkyl group having from 1 to 4 carbon atoms; and
where R_3 is an alkyl group having from 1 to 4 carbon atoms or furyl.

4,100,041

METHOD OF FORMING A COLORED AND OXIDE FILM ON ALUMINUM AND ALUMINUM ALLOYS

Shozo Kimura, Osaka, and Hidetoshi Yoshida, Oizumi, both of Japan, assignors to Toyo Chuo Kagaku Kenkyusho, Oizumi, Japan

Continuation-in-part of Ser. No. 780,494, Mar. 23, 1977, abandoned. This application Sep. 29, 1977, Ser. No. 837,878
Claims priority, application Japan, Apr. 14, 1976, 51-41247

Int. Cl.[2] C25D *11/08, 11/10*

U.S. Cl. 204—58 **1 Claim**

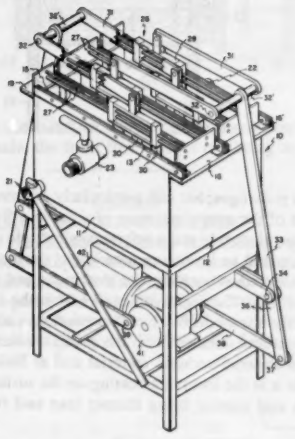
1. A method of forming a yellow-black colored and oxide film on aluminum and aluminum alloys comprising subjecting defatted and washed aluminum and aluminum alloys to treatment of electrolytic oxidation by direct current, ac-dc combined current or pulse wave-form in an electrolyte comprising 5 - 500 g/l of sulfofumaric acid and at least one of 0.1 - 30 g/l of sulfuric acid, 0.1 - 50 g/l of oxalic acid and 0.1 - 50 g/l of metal sulfate.

4,100,042

PROCESS FOR ELECTROWINNING METALS FROM A METAL-BEARING SOLIDS SLURRY

Bruce C. Wojcik, Twin Falls, Id.; Wilfred H. Herrett, Box Z, Filer, Id. 83328; Gerald D. Cooper, Rte. #N. Box 106, Pocatello, Id. 83201; Reed Goold, Rte. #4, and Charles W. Wojcik, 1004 Delmar Dr., both of Twin Falls, Id. 83301, assignors to Reed Goold; Charles W. Wojcik, both of Twin Falls; Gerald D. Cooper, Pocatello and Wilfred H. Herrett, Filer, all of, Id.

Division of Ser. No. 567,949, Apr. 14, 1975, Pat. No. 4,022,678.
This application Mar. 2, 1977, Ser. No. 773,685
Int. Cl.[2] C25C *1/00, 1/12*
U.S. Cl. 204—105 R 8 Claims



1. A process for electrowinning metals from a slurry containing metal bearing solids in an electrolyte containing an oxidizing agent in solution in an electrolyte cell having a plurality of spaced-apart anode and cathode plates, comprising the step of directing more than one-half of the flow of said slurry against said anode plate to minimize polarization at the anode plate, thereby creating maximum efficiency at the anode plate and increasing the valance of the oxidizing agent to its higher state.

4,100,043

ATMOSPHERIC LEACH ION-EXCHANGE PROCESS FOR TREATING IRON-CONTAINING NICKEL-COPPER MATTE

Eddie C. Chou, Arvada; Paul B. Queneau, Golden; John M. Laferty, Wheatridge, and John R. Carlberg, Arvada, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Sep. 17, 1976, Ser. No. 724,380
Int. Cl.[2] C25C *1/12*
U.S. Cl. 204—108 4 Claims

4. A process for leaching comminuted nickeliferous sulfide matte containing by weight about 20 to 75% nickel, about 5 to 50% copper, over 0.5 to 20% iron, optionally small amounts of cobalt, and non-stoichiometric sulfur ranging from over 4 to about 24%, the sum of the nickel, copper and sulfur contents being at least about 80% which comprises,

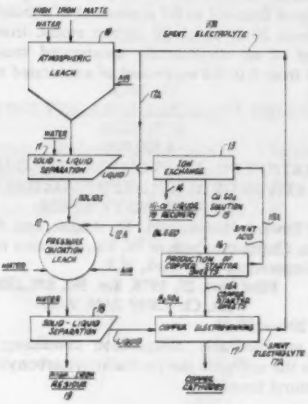
subjecting said comminuted matte to atmospheric leaching in a spent copper electrolyte-sulfuric acid solution of pH below 2 while vigorously aerating said solution to leach selectively nickel from said matte and produce a pregnant nickel solution containing less than about 10 ppm iron and copper ranging from over 5 ppm to about 750 ppm and leaving a copper-nickel-containing sulfide residue,

separating said pregnant nickel solution from said copper-nickel-containing sulfide residue,

passing said pregnant nickel solution through an ion-exchange resin bed selective to the absorption of copper selected from the group consisting of $RN(CH_2COOH)_2$, $RNH(C_2H_4NH)_nH$ and $RC(NH_2)NOH$, where R comprises polymers and copolymers of vinyl aromatic compounds and n is an integer of 1 or above, thereby removing said copper from said solution with a purified nickel solution going to nickel recovery,

eluting said copper from said ion-exchange resin bed by passing a sulfuric acid solution therethrough of pH below 2 and thereby produce a copper sulfate-sulfuric acid electrolyte,

producing copper starting sheet electrodes from said electrolyte for use as cathodes in the electrowinning of copper,



subjecting said copper-nickel sulfide residue from said atmospheric leach to high pressure oxidation leach with a sulfuric acid-containing solution at a temperature of about 150° to 250° C and a pressure of about 200 to 900 psig and thereby produce a pregnant copper sulfate-containing electrolyte and a leached residue which is removed,

subjecting said pregnant copper sulfate-containing electrolyte to electrowinning to recover copper therefrom and form a spent copper electrolyte with regenerated sulfuric acid,

and recycling said spent copper electrolyte into said leaching process.

4,100,044

PROCEDURE FOR REMOVING ALUMINUM FROM AN Al-Al_3Ni TWO-PHASE MATRIX

Charles L. Hussey, USAF Academy, Colo.; John C. Nardi, Brunswick, Ohio; Armand A. Fannin, Jr., USAF Academy, Colo.; Lowell A. King, Colorado Springs, Colo., and John K. Erbacher, USAF Academy, Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 15, 1977, Ser. No. 816,223
Int. Cl.[2] C25F *3/00, 3/04, 5/00*
U.S. Cl. 204—146 4 Claims

1. An electrolytic process for separating aluminum from a solid, two-phase matrix of aluminum and trialuminum nickelide filaments which comprises the steps of passing an electric current between (1) a cathode composed of an inert material and (2) an anode composed of a two phase matrix of aluminum and tri-aluminum nickelide filaments while (3) both anode and cathode are immersed in an anhydrous aluminum halide containing molten salt electrolyte to effectively remove said aluminum from said matrix without adversely affecting said trialuminum nickelide filaments.

4,100,045

RADIATION CURABLE EPOXY COATING COMPOSITION OF DIMER ACID MODIFIED VINYL ESTER RESIN

Gary W. Bogan, and Richard A. Hickner, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 29, 1975, Ser. No. 644,693
Int. Cl.[2] C08F 8/00; C08L 63/00
U.S. Cl. 204—159.16 13 Claims

1. A radiation curable composition said composition consisting essentially of the reaction product of from 0.9 to about 1.05 equivalents of carboxylic acid ingredients for 1.0 equivalents of a polyepoxide wherein said carboxylic acid ingredients consist essentially of from 0.1 to 0.3 equivalent of a dicarboxylic acid having from 20 to about 36 carbon atoms, from 0.5 to 0.9 equivalent of an ethylenically unsaturated monocarboxylic acid, and from 0 to 0.3 equivalent of a saturated monocarboxylic acid.

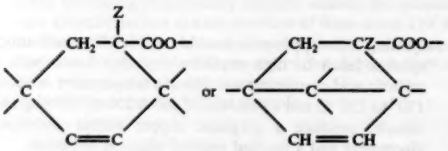
4,100,046

RADIATION POLYMERIZABLE CYCLOALKENYL DERIVATIVES OF ACRYLATED EPOXIDIZED FATTY OILS OR FATTY ACIDS

Leonard Edward Hodakowski, St. Albans, and Claiborn Lee Osborn, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 25, 1975, Ser. No. 635,150
Int. Cl.[2] C08F 2/46, 4/00
U.S. Cl. 204—159.23 13 Claims

1. A polymerizable composition containing compounds having in the molecule the cycloalkenylcarbonyloxy group of the structural formula:



wherein Z is hydrogen or methyl and wherein said cycloalkenylcarbonyloxy group is attached to the molecule via the free valence bond of the carbonyloxy group thereof, said composition being the reaction product of (A) an unsubstituted or substituted conjugated diene with (B) an acrylate or methacrylate ester of an epoxidized long chain unsaturated fatty oil, fatty acid or ester thereof, wherein the ratio of said diene charged per equivalent vicinal hydroxyl acryloxy group charged is from 0.1:1 to 1.2:1.

4,100,047

ULTRAVIOLET CURABLE AQUEOUS COATINGS

William H. McCarty, White House Station, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,144
Int. Cl.[2] C08F 2/50, 4/00
U.S. Cl. 204—159.23 12 Claims

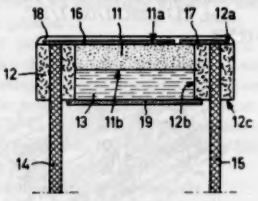
1. An ultraviolet curable aqueous coating solution comprising an hydroxy functional ethylenically unsaturated ultraviolet curable material reacted with a polycarboxylic acid or anhydride and dissolved in water with the aid of an amine photoinitiator, said ultraviolet curable material being monoethylenic or polyethylenic and monohydric or polyhydric and having a molecular weight providing a viscosity ranging from a fluid liquid to a viscous semi-solid, the proportion of said polycarboxylic acid or anhydride providing an acid number of from 20–300, and said amine providing a pH of from 6.0–11.0, said solution further containing a photosensitizer rendering the composition sensitive to ultraviolet light.

4,100,048

POLAROGRAPHIC CELL

Jean Pompei, Noisy-le-Roi, and Francis Pierrot, Rueil, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 506,249, Sep. 16, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,490
Claims priority, application France, Sep. 20, 1973, 73 33743
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 P 5 Claims



1. In a polarographic cell particularly adapted for the measurement of the partial pressure of a gas in a fluid comprising a detection electrode and a reference electrode immersed in an electrolyte and an insulating membrane, permeable to the gas being measured, separating the electrodes and the electrolyte from said fluid, the improvement wherein the electrolyte is at least partly immobililized by absorption in a rigid, insulating, porous material selected from the group consisting of sintered glass and sintered ceramic material and at least the detection electrode is in the form of a coating on the surface of said rigid material, said coating being thinner than said rigid material.

4,100,049

COATED CATHODE FOR ELECTROLYSIS CELLS

James R. Brannan, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jul. 11, 1977, Ser. No. 814,703
Int. Cl.[2] C25B 9/00, 11/04
U.S. Cl. 204—242 6 Claims

1. In an electrolytic cell for the production of halogen and alkali metal hydroxides or alkali metal hypohalides and chlorates from alkali metal halide solutions wherein said cell is equipped with an anode and a cathode, the improvement which comprises a composite cathode comprising a metal substrate having thereon a coating comprising a mixture of palladium oxide and zirconium dioxide, said metal substrate selected from a group consisting of iron, nickel, cobalt and alloys thereof.

4,100,050

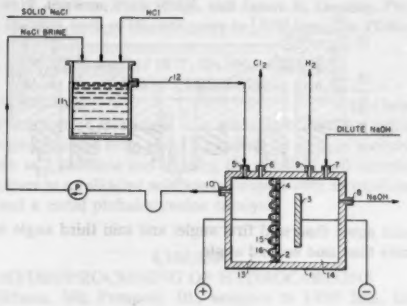
COATING METAL ANODES TO DECREASE CONSUMPTION RATES

Edward H. Cook, Jr., Lewiston, and Gerald R. Marks, Youngstown, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,242
Int. Cl.[2] C25B 1/16, 1/26, 9/00
U.S. Cl. 204—252 17 Claims

1. An electrolysis cell comprising a housing, having, in substantially vertical configuration, an anode compartment containing a porous valve metal anode, a cathode compartment containing a cathode and a cation-active permselective membrane which is substantially impervious to liquids and gases separating said anode and said cathode, said membrane

being emplaced on the surface of said anode which faces the cathode, spaced apart from said cathode, said anode having a

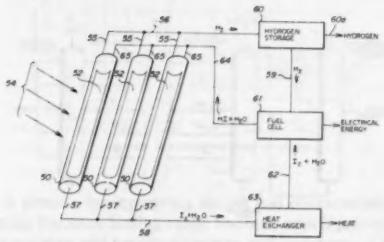


coating of a noble metal, or alloy or oxide thereof on the back face of the anode, the front face thereof not being so coated.

4,100,051
LIGHT ENERGY CONVERSION

Jack S. Kilby, 7723 Midbury, Dallas, Tex. 75230; Jay W. Lathrop, Clemson, S.C., and Wilbur A. Porter, College Station, Tex., assignors to Jack S. Kilby, Dallas, Tex.

Continuation-in-part of Ser. No. 599,473, Jul. 28, 1975, Pat. No. 4,021,323. This application Dec. 2, 1976, Ser. No. 747,022
Int. Cl.[2] C25B *9/00*; H01M *8/04, 8/18*
U.S. Cl. 204—266 **23 Claims**



1. An energy converter which comprises:
a. a plurality of photovoltaic generators,
b. an electrolyte in physical contact with said generators,
c. means for exposing said generators to light, causing an electric potential to be developed by said generators which will cause current flow through said electrolyte to produce an electro chemical reaction in said electrolyte,
d. means for separating at least one electro chemical reaction product and transporting at least one such product from said converter, and
e. means for extracting and recombining said at least one electro chemical reaction products to produce electrical energy.

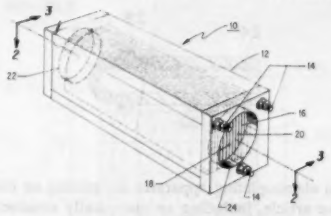
5. An optico-electro chemical energy converter which comprises:
a. a cell adapted to contain an electrolyte and to confine gases above the surface of the electrolyte,
b. a photovoltaic generator mounted in said cell and having at least two surface areas, one adapted to be wetted by the electrolyte and the other insulated to prevent wetting by the electrolyte,
c. means transmissive of optical energy for illuminating said generator,
d. means for completing an electrical circuit from said generator when said cell contains the electrolyte for dissociation of components of the electrolyte in response to light radiation induced voltage from said generator, at least one of said components being gaseous, and
e. means for extracting product gas from said cell.

18. The method of solar energy conversion which comprises:
a. exposing a plurality of photovoltaic generators to light to develop electric potentials,
b. contacting at least selected contact areas of said generators with an electrolyte to establish current flow through said electrolyte for producing an electro chemical reaction in said electrolyte,
c. collecting at least one of the reaction products, and
d. recombining said reaction products to produce electrical energy.

4,100,052
ELECTROLYTIC GENERATION OF HALOGEN BIOCIDES

Neil W. Stillman, Madison, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Nov. 11, 1976, Ser. No. 740,870
Int. Cl.[2] C25B *1/26, 9/00*; C02B *1/82*
U.S. Cl. 204—268 **12 Claims**



1. An electrolytic cell for the production of halogen for use as a biocidal agent comprising: an enclosure; means for connecting said enclosure to a liquid distribution system of the facility to be biocidally affected so that the liquid must flow therethrough; a plurality of spaced planar electrode plates attached to said enclosure interior in parallel fashion across the entire cross-section area of said means for connecting said enclosure to a liquid distribution system; each of said spaced planar electrode plates having coatings on one side thereof to promote ionic potential travel in one direction through each of said spaced planar electrode plates; said means for connecting said enclosure to said liquid distribution system consisting of openings at opposing ends of said enclosure of a size nearly as large as the height of said spaced planar electrode plates; means for connecting a power source to substantially less than all of said spaced planar electrode plates to promote an electrical field thereacross to evolve halogen which is dissolved in the liquid flowing through said distribution system; and a halogen salt concentration in the liquid greater than 0.5 grams per liter.

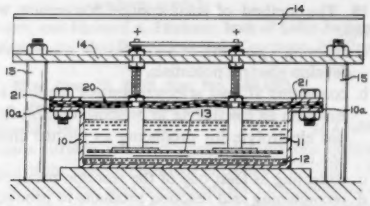
4,100,053
FLEXIBLE COVER FOR A CHLORINE CELL

Ralph F. Anderson, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 7, 1977, Ser. No. 858,234
Int. Cl.[2] C25B *9/00, 1/40*
U.S. Cl. 204—279 **6 Claims**

1. A flexible elastomeric cover for an electrolysis cell in which free chlorine is generated, the said cover comprising an integral laminated sheet with the face thereof that is adapted to be exposed to free chlorine formed of a compound the princi-

pal ingredient of which is chlorinated polyethylene and the opposite face formed of a compound the principal ingredient of



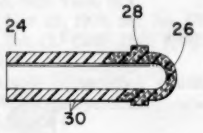
which is an ethylene-propylene terpolymer material which is resistant to ozone.

4,100,054

COMBINATION INSULATING SLEEVE AND ELECTRICAL CONTACT MEMBER FOR ELECTRO-PLATING RACK

Gideon A. DuRocher, Mt. Clemens, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Mar. 11, 1977, Ser. No. 777,281
Int. Cl.[2] C25D *17/06*
U.S. Cl. 204—297 W **3 Claims**



1. In an electroplating apparatus for plating an electrically conductive article, including an electrically conductive rack and supporting means thereon for supporting said article, an electrolyte bath into which said article is immersed, an electrically insulating coating on that portion of said rack and supporting means which is immersed into said electrolyte bath, a portion of said electrically insulating coating on said supporting means being removed to form a contact area at which said article and rack electrically connect one another, the improvement which comprises:

a composite electrical contact interposed between said supporting means and said article at said contact area, said composite electrical contact comprising a unitary body having an insulative portion and a resilient, normally non-conductive pressure sensitive contact portion, the surface of said pressure sensitive contact portion facing said article being ribbed such that the ribs extend above the surface of said insulative portion, whereby the ribs are conductive when compressed by the article being plated.

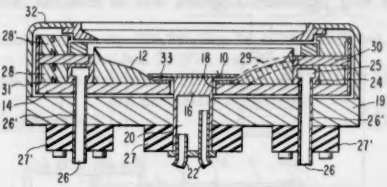
4,100,055

TARGET PROFILE FOR SPUTTERING APPARATUS

Robert M. Rainey, Ben Lomond, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 10, 1977, Ser. No. 805,485
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 **6 Claims**

1. A target for sputter coating apparatus comprising an annular body having an inner surface surrounding and generally sloping away from a central axis of said body, said surface comprising an inner portion, a middle portion and an outer portion closest said axis, a tangent to the surface of said middle portion forming a first angle with said axis, a tangent to the surface of said inner portion forming a second angle with said axis, a tangent to the surface of said outer portion forming a third angle with said axis, said first angle being an acute angle, and said first angle being different from said second and third angles, wherein said first angle is acute, said second angle is



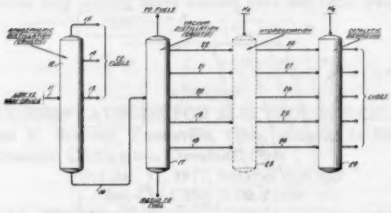
more acute than said first angle, and said third angle is more acute than said second angle.

4,100,056

MANUFACTURE OF NAPHTHENIC TYPE LUBRICATING OILS

Ronald W. Reynolds, Wilmington, Del., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Dec. 27, 1976, Ser. No. 754,284
Int. Cl.[2] C10G *41/00*
U.S. Cl. 208—57 **6 Claims**



1. A process for making naphthenic type lubricating oils from a low VI waxy crude which consists of distilling said low VI waxy crude to 500° to 650° F at atmospheric pressure to separate distillable fractions therefrom, subjecting the residue to a vacuum distillation at about 25 to about 125 mm Hg absolute pressure to obtain one or more distillate fractions having an SUS at 100° F viscosity of from about 60 to about 2000, and catalytically dewaxing all of said distillates in the presence of an H+ form mordenite catalyst containing a Group VI or Group VIII metal at 550° F, 500 to 1500 psig and 0.25 to 5.0 LHSV to obtain said naphthenic type oils having a pour point of from about −50° to +20° F.

5. A process for making naphthenic type lubricating oils fom a VI waxy crude which consists of atmospherically distilling said crude to remove wet gas, straight run gasoline, naphtha and atmospheric gas oil fractions, subjecting the residue to a vacuum distillation at about 25 to 120 mm mercury pressure absolute to obtain gas oul fractions having an SUS at 100° F viscosity of from about 60 to about 2000 hydrotreating said gas oil fractions in the presence of a Ni/Mo catalyst at about 650° F, a hydrogen pressure of about 800 psig and a LHSV of about 1.0 and catalytically dewaxing said hydrotreated gas oil fractions in the presence of an H+ form mordenite catalyst containing platinum at a temperature of about 550° to about 600° F, a hydrogen pressure of about 850 psig, and a LHSV of from about 0.8 to about 1.0 to obtain napthenic type oils having a pour point of from about −60° to about 20° F.

4,100,057

METHOD OF TREATING A SOUR PETROLEUM DISTILLATE

David H. J. Carlson, Park Ridge, and James R. Deering, Prospect Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 1, 1977, Ser. No. 820,472
Int. Cl.[2] C10G 27/06
U.S. Cl. 208—206 10 Claims

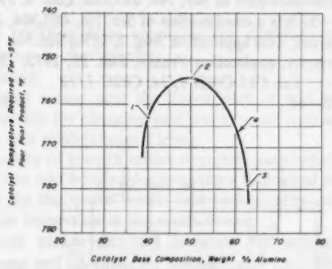
1. A method of treating a sour petroleum distillate which comprises admixing from about 5 to about 50 wt ppm morpholine with said distillate and treating the distillate and morpholine mixture in an alkaline solution in contact with an oxidizing agent and a metal phthalocyanine catalyst.

4,100,058

HYDROPROCESSING OF HYDROCARBONS

Lee Hilfman, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 716,922, Aug. 23, 1976, Pat. No. 4,061,563, which is a division of Ser. No. 599,561, Jul. 28, 1975, Pat. No. 4,003,956, which is a continuation-in-part of Ser. No. 466,759, May 3, 1974, Pat. No. 3,931,048. This application Sep. 30, 1977, Ser. No. 838,266
Int. Cl.[2] C10G 23/02; B01J 27/02, 27/10
U.S. Cl. 208—264 5 Claims



1. A process for improving the jet fuel characteristics of a sulfurous kerosene boiling range fraction, which process comprises reacting said kerosene fraction and hydrogen, at a maximum catalyst temperature below about 750° F., in a catalytic reaction zone containing a catalytic composite comprising a combination of a nickel component, and a tungsten component with a silica-alumina carrier material wherein said carrier material is co-gelled silica-alumina consisting of from about 43 percent to about 57 percent by weight alumina and from about 57 to about 43 percent by weight silica and wherein said components are present in amounts sufficient to result in the composite containing, on an elemental basis, about 2 to about 10 percent by weight of the nickel component and about 8 to about 20 percent by weight of the tungsten component.

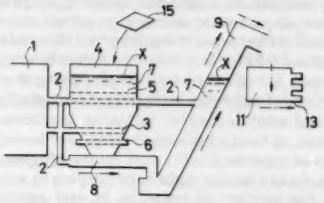
4,100,059

ASPHALT RECYCLE SYSTEM

Michio Jinno, 6-3, Yasudadohri, Showa-ku, Nagoya-shi, Japan

Filed Nov. 23, 1976, Ser. No. 744,308
Claims priority, application Japan, Dec. 11, 1975, 50-148246; May 14, 1976, 51-55945; May 17, 1976, 51-56317; May 17, 1976, 51-56318; May 17, 1976, 51-56319; May 20, 1976, 51-57231
Int. Cl.[2] B03B 9/02
U.S. Cl. 209—3 5 Claims

1. An asphalt recycling method comprising the steps of:
a. introducing 1) asphalt waste and 2) activated terra alba, activated carbon or a mixture thereof into a tank of water;
b. jetting steam into said water to heat said water to a temperature sufficient to soften the asphalt waste; and
c. mechanically subdividing the asphalt waste while immersed in the heated water into aggregate grains, each aggregate having a surface coated with a thin asphalt film.



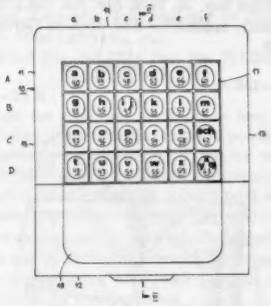
2. The method of claim 1 further comprising sorting said aggregate grains into a predetermined number of size groups.

4,100,060

INDEX CARD REGISTER WITH SELECTOR DEVICE

Hans Halm, Herne, Germany, assignor to Firma Niveau AG, Basel, Switzerland

Filed Jan. 18, 1977, Ser. No. 760,260
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1976, 2647067
Int. Cl.[2] B07C 5/00
U.S. Cl. 209—80.5 11 Claims



1. An index card register with selector means, including a housing consisting of a cover member and a bottom member, a plurality of counter spring-biased selector keys, a drawer biased by a compression spring and adapted to be locked by a locking mechanism, a plurality of index cards defining a replaceable stack of index cards accommodated within the drawer, the index cards including marginal cutouts, means for unlocking the drawer and exposing to sight an index card selected by actuation of a corresponding selector key, by unlocking the drawer and moving the same into a position projecting from the housing under the bias of the compression spring, the drawer including entrainment cams of a resilient material adapted to engage entrainment apertures of the index cards, the index cards including selector apertures adapted to be engaged by the counter-spring-biased selector keys, said index card register being characterized by the plurality of selector keys being arranged in an array in several rows and columns on the cover member, each selector key being mounted on one end of an associated one-armed pivot lever, the other end of said pivot lever being rotatably journalled on a mounting rod serving as a pivot axis, the mounting rod being disposed in a forward region of said housing, said pivot lever being held in a substantially horizontal position by resilient means and includes, at its free end, a card retainer pin depending downwardly toward the bottom wall of said housing bottom member, said card retainer pins of said pivot levers being arranged in two rows along the lower surfaces of said pivot

levers whereby the card retainer pins of every other pivot lever define a row; a drawer detent bar resiliently mounted in a rearward region of said bottom wall of said housing bottom member, said drawer detent bar including a drawer locking mechanism adapted to be unlocked to permit outward movement of said drawer when being biased by the card retainer pin of a depressed selector key; selector tongues bearing said selector apertures for said card retainer pins along rearward marginal portions of said index cards disposed in a stack within said drawer, said selector tongues increasing in extension by step-like increments from a lowermost index card having one aperture up to an uppermost index card having a highest number of apertures, from a bottom right hand position to a top left hand position, the number of apertures in said selector tongues increasing from the lowermost index card to the uppermost index card by one for each card, whereby the incremental one aperture in each index card as compared to the apertures in an adjacent underlying index card is exposed with respect to the aperture-containing selector tongue portions of an adjacent underlying index card; and a triangular entrainment cam in a forward region of said drawer, said entrainment cam adapted to cooperate with entrainment apertures in a forward region of said index cards.

4,100,061

SEPARATOR

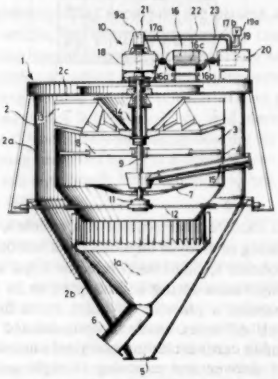
Hubert Eickholt, Neubeckum, and Günter Heinzel, Ahlen, both of Fed. Rep. of Germany, assignors to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Sep. 20, 1976, Ser. No. 724,272

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1975, 2547709

Int. Cl.² B07B *7/08*

U.S. Cl. 209—139 A **4 Claims**



1. A particles separator comprising a housing defining a circular side wall extending about a vertical axis, a circular separator chamber coaxially disposed within said circular side wall of said housing, a hollow shaft rotatable about said axis, a centrifugal fan in said housing at the upper portion of said separator chamber supported by and rotatable with said hollow shaft about said axis for producing an air stream in an upward direction through said separator chamber, a core shaft mounted concentrically in said hollow shaft and rotatable independently with respect to said hollow shaft about said axis, a scatter plate positioned below said centrifugal fan and supported by and rotatable with said core shaft about said axis, an impeller positioned between said centrifugal fan and said scatter plate and supported by and rotatable with said core shaft about said axis, drive means mounted on said housing and comprising a drive motor, first drive connection means connected between said drive motor and said hollow shaft for rotating said centrifugal fan, and second drive connection means connected between said drive motor and said core shaft for rotating said scatter plate and said impeller, said second drive connection means comprising a hydraulic pump driven by said drive motor, a hydraulic motor in driving connection with said core shaft and driven by said hydraulic pump, and flow control means for selectively varying the speed of said hydraulic motor with respect to said hydraulic pump whereby the drive motor is operated to rotate the hollow shaft and fan up to a desired speed of rotation and the flow control means is selectively operated to vary the driven speed of the hydraulic motor, core shaft, scatter plate and impeller independently of the rotation of the hollow shaft and fan.

4,100,062

METHOD OF TREATMENT OF AN OXIDIZABLE MATERIAL BY A BIOCHEMICAL PROCESS

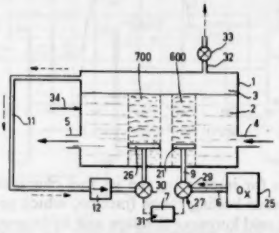
Paul Boulenger, Le Chesnay; Nicole Angelier, and Jean-Pierre Torres, both of Echirolles, all of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Continuation-in-part of Ser. No. 637,869, Dec. 4, 1975, abandoned, which is a continuation of Ser. No. 480,304, Jun. 17, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,902

Claims priority, application France, Jun. 25, 1973, 73 23074

Int. Cl.² C02B *1/34;* C02C *1/12*

U.S. Cl. 210—14 **9 Claims**



1. A method of biochemical treatment of a liquid mass comprising water with an oxidizable material, in an oxygenation zone comprising a gaseous atmosphere including oxygen surmounting said liquid mass, comprising the following operations:

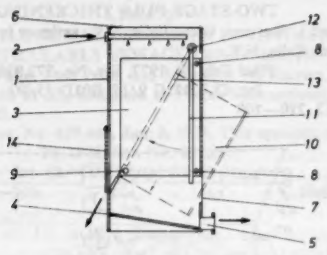
1. in a first step introducing an oxygenation gas, comprising more than 50% by volume of oxygen supplied from an external source into the heart of the liquid mass in the form of bubbles, the duration (a) of said introduction step being at most equal to the mean duration (d) of travel of said bubbles up to the inter-face between said gaseous atmosphere and said liquid mass;
2. in a second step effecting a circulation of either said liquid mass or said gaseous atmosphere in contact one with the other by the use of mechanical oxygenation, the duration (b) of said circulation step being at least equal to the mean duration (d) of travel of the bubbles of the oxygenation gas in the liquid mass;
3. cyclically repeating steps 1 and 2; and
4. maintaining at least one of the following parameters namely the duration (b) of said circulation step, the total period (a + b) of said sequence, and the mass flow-rate of the oxygenation gas, such that the mean rate of flow of oxygenation gas to said oxygenation zone corresponds substantially to the consumption of oxygen.

4,100,063

METHOD AND APPARATUS FOR THE BIOLOGICAL CLEANSING OF WASTE WATER

Ludwig Hartmann, Karlsruhe, Fed. Rep. of Germany, assignor to Maschinenfabrik Hellmut Geiger, Karlsruhe-West, Fed. Rep. of Germany

Continuation of Ser. No. 543,423, Jan. 23, 1975, abandoned, which is a continuation of Ser. No. 380,545, Jul. 19, 1973, abandoned. This application May 6, 1976, Ser. No. 683,743
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1972, 2235470
Int. Cl.² C02C 1/04
U.S. Cl. 210—17 7 Claims



1. A trickling filter apparatus for cleaning waste water, comprising, in combination:

a housing;

charging means near the upper part of said housing and operable for charging said waste water into said housing up to a predetermined level;

a plurality of growth means uprightly suspended adjacently within said housing for growing a biological mass sprayable by the waste water, said biological mass being free from immersion in the waste water;

removal means disposed between the adjacent growth means and operable for mechanically removing said biological mass from said growth means to form a sludge;

first discharge means disposed in said housing below a substantial portion of said growth means and operable to cooperate with said removal means for discharging said sludge from said housing; and

second discharge means disposed near the lowermost part of said housing and below said first discharge means and operable for continuously discharging the cleaned waste water, the predetermined level being between said first and said second discharge means.

5. A method of cleaning waste water in a trickling filter comprising a housing, charging means near the upper part of said housing and operable for charging said waste water into said housing up to a predetermined level, a plurality of growth means uprightly suspended adjacently within said housing for growing a biological mass free from immersion in the waste water, removal means disposed between the adjacent growth means and operable for mechanically removing said biological mass from said growth means to form a sludge, first discharge means disposed in said housing below a substantial portion of said growth means, above said predetermined level, and operable to cooperate with said removal means for discharging said sludge from said housing, and second discharge means disposed near the lowermost part of said housing and below said first discharge means and operable for continuously discharging the cleaned waste water, comprising the steps of:

charging the waste water into said apparatus, said predetermined level being between said first and said second discharge means; spraying the waste water onto said growth means; continuously discharging the cleaned waste water; and removing the biological mass.

4,100,064

PURIFICATION OF WATER BY REVERSE OSMOSIS USING A SUPPORTED SEMI-PERMEABLE MEMBRANE

George Martin Gale, Shrewsbury, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 467,477, May 6, 1974, abandoned, which is a continuation of Ser. No. 304,783, Nov. 8, 1972, abandoned. This application Nov. 19, 1975, Ser. No. 633,560
Claims priority, application United Kingdom, Nov. 23, 1971, 54432/71
Int. Cl.² B01D 13/00
U.S. Cl. 210—23 H 3 Claims

1. In a method for purifying water by reverse osmosis using a semi-permeable membrane, the improvement wherein the membrane is supported by the outer surface of an extruded tube of water-permeable rigid p.v.c. so that impure water is contacted with said outer surface and purified water is recovered from the bore of the tube, the p.v.c. having an apparent density of from 0.5 to 1.3g/cc, and an average pore diameter of from 5 to 500 microns, at least 50% of the pores being interconnected and 95 to 99.5% of the pores in the tube being accessible from the inner or outer surface thereof, the tube having 1 to 10 holes/mm² on the outer surface thereof, having an external diameter of from 1.5 mm to 8 mm and having a wall thickness of at least 0.5 mm.

4,100,065

METHOD FOR REMOVING OF MULTIVALENT HEAVY METALS FROM METAL PLATING WASTE EFFLUENTS

James E. Etzel, Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Dec. 22, 1976, Ser. No. 753,218
Int. Cl.² C02B 1/44
U.S. Cl. 210—38 B 9 Claims

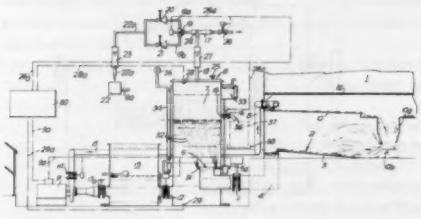
1. A method for removing multivalent heavy metal ions from metal plating waste effluents to avoid polluting the water supplies comprising passing a metal plating waste effluent having a multivalent heavy metal ion concentration of 25 mg/l or less through a cation-exchange column packed with exfoliated vermiculite particles, whereby the multivalent heavy metal ions are exchanged for a non-polluting magnesium ion and the heavy metal ions are retained by the vermiculite lattice so as to prevent polluting the water supplies with the discharged metal plating waste effluent.

4,100,066

TREATING PAINT WASTE SOLIDS

Ivan Bloomer, and Ronald William Young, both of London, England, assignors to Carrier Drysys Limited, London, England

Filed May 5, 1976, Ser. No. 683,424
Claims priority, application United Kingdom, May 7, 1975, 19240/75
Int. Cl.² C02B 1/00
U.S. Cl. 210—44 29 Claims



1. A method of collecting and disposing of waste paint solids contained in an aqueous medium which flows from a paint spray booth into a water container located beneath the booth, the method comprising the steps of:

flowing paint laden aqueous medium from the water container into the lower portion of a vessel which has sides, a top and a bottom and which is located outside the booth;

retaining the aqueous medium in the vessel for a residence time sufficient to permit paint solids to accumulate as a raft on the surface of the aqueous medium in the vessel; and

by applying fluid pressure to the raft causing the accumulated paint solids to flow from an outlet at an upper portion of the vessel into a container.

4,100,067

METHOD FOR SEQUESTERING METAL IONS

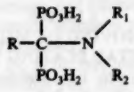
Klaus Sommer, Heidelberg, and Günter Raab, Laudenbach, Bergstr., both of Fed. Rep. of Germany, assignors to Benckiser-Knapsack GmbH., Ladenburg am Neckar, Fed. Rep. of Germany

Division of Ser. No. 675,479, Apr. 9, 1976, Pat. No. 4,029,696. This application Jan. 18, 1977, Ser. No. 760,367

Int. Cl.² C02B *5/06*

U.S. Cl. 210—58 **3 Claims**

1. A method of sequestering bivalent and polyvalent metal ions in an aqueous system, comprising the step of adding an effective sequestering amount of a compound of the formula



in which

R is hydrogen, lower alkyl, phenyl, hydroxy lower alkyl, or carboxy lower alkyl;

R_1 is hydrogen, lower alkyl, hydroxy lower alkyl, dihydroxy lower alkyl, or hydroxy carboxy lower alkyl, and

R_2 is hydroxy lower alkyl, or the alkali metal salts thereof, to said aqueous system in order to effect complex formation with said bivalent and polyvalent metal ions.

4,100,068

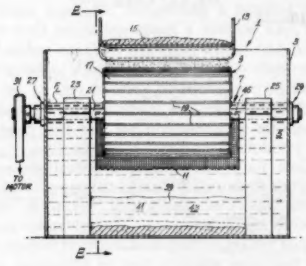
SYSTEM FOR THE DIELECTROPHORETIC SEPARATION OF PARTICULATE AND GRANULAR MATERIAL

Cy Edward Jordan, and Casimir Paul Weaver, both of Tuscaloosa, Ala., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 13, 1977, Ser. No. 759,202

Int. Cl.² B03C *5/00*

U.S. Cl. 204—300 R **11 Claims**



1. A dielectrophoretic separator for the continuous separation of particulate and granular materials, which separator comprises, in combination:

a vessel containing a liquid dielectric medium;

an electrode configuration disposed within the vessel and including:

a cylindrical-shaped rotatable electrode having a nonuniform conductor surface, and

an arcuate-shaped perforated electrode spaced radially outward from the rotatable electrode to define a contact zone therewith; and

means for applying a source of voltage to the electrode configuration to produce a divergent electric field in the contact zone, wherein the particulate and granular materials are immersed in the divergent electric field.

4,100,069

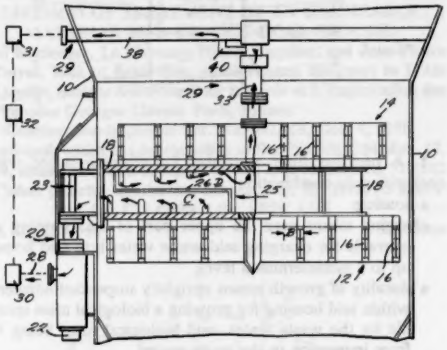
TWO-STAGE PULP THICKENING

Michael I. Sherman, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,928

Int. Cl.² D21C *9/18*; B01D *33/00*

U.S. Cl. 210—109 **2 Claims**



1. Apparatus for screening pulp comprising

two sets of concentric screens mounted in a tower, each set being vertically spaced from the other, the lowermost screen set being a first screen set, and the uppermost screen set being a second screen set, and each screen set comprising a plurality of radially spaced screens;

the screens of said first screen set being radially offset from the screens of said second screen set;

a plurality of hollow mounting arms between said screen sets and each commonly mounted said screen sets and in operative fluid communication with at least said some of screens of said screen sets, each of said hollow mounting arms being in communication with screens of each of said first and second screen sets;

means for dividing each of said hollow mounting arms into first and second chambers to prevent fluid communication between the interior screens of said first and second screen sets;

first and second withdrawing means for withdrawing screened-out liquid from said mounting arms, said first withdrawing means comprising a suction source for withdrawing screened liquid generally radially outwardly from said first screen set; said second withdrawing means comprising a suction source for withdrawing screened liquid axially and then radially outwardly from said second screen set;

said second withdrawing means further comprising a tubular shaft concentric with said screens of said second screen set and extending axially vertically upwardly from said screens of said second screen set; a stationary withdrawal conduit in fluid communication with said tubular shaft; bushing means for providing liquid-tight axially slidable engagement between said tubular shaft and said stationary withdrawal conduit; and a radially extending hollow

support arm mounted in the tower vertically above said stationary withdrawal conduit, and supporting said withdrawal conduit, said hollow support arm being in fluid communication with said withdrawal conduit;

means for controlling operation of said first and second suction sources to substantially balance extraction flow rates of liquid through said first and second screen sets; and

means for axially reciprocating said hollow mounting arms and screen sets connected thereto; whereby liquid-tight axial sliding movement takes place between said tubular shaft and said stationary withdrawal conduit of said second withdrawing means.

4,100,070

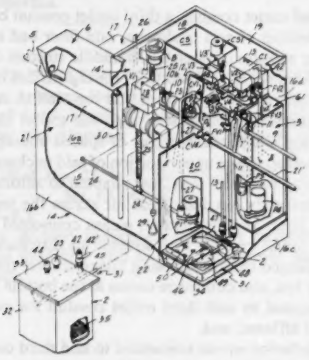
APPARATUS FOR USE IN WATER PURIFICATION PARTICULARLY SEWAGE TREATMENTS

Eugene B. White, Oak Park, and Mahindar N. Sharma, Lake Zurich, both of Ill., assignors to Filters International, Inc., Chicago, Ill.

Division of Ser. No. 429,488, Jan. 2, 1974. This application Sep. 10, 1975, Ser. No. 611,853

Int. Cl.[2] C02C *1/04*; B01D *23/14*

U.S. Cl. 210—136 **68 Claims**



1. In a bio-chemical oxidation/physio-chemical adsorption sewage treatment system, the combination of a sewage receiving tank, means for effecting aeration of the contents therein for primary treatment thereof, and in which tank a secondary settling treatment may be effected, a tertiary filter and adsorption structure comprising a receptable containing an upflow filtration mixed bed graded from coarse to fine particles in the direction of flow and an adsorption bed containing activated carbon disposed thereabove, means for conducting effluent in said receiving tank, resulting from the secondary treatment, to an inlet disposed below the filtration bed of said tertiary structure for upward passage therethrough, the latter having an outlet therein disposed above said adsorption bed, a storage tank, means for conducting output renovated water of said tertiary structure to said storage tank for storing a predetermined volume of such water, and conducting an excess thereover from the system, means for selectively supplying water from said storage tank to the bottom of said tertiary structure, means for selectively supplying an oxidizing gas, under pressure, to the bottom of said tertiary structure, means operatively connecting said receiving tank and the output of the tertiary structure for conducting liquid from the latter to said receiving tank, and valve means disposed in the various supply and conducting means for controlling flow therethrough, whereby respective fluid flows may be selectively established, one for effluent from the receiving tank upwardly through the tertiary structure to the storage tank, another for renovated water from the storage tank upwardly through the tertiary structure to the receiving tank, and a third from the gas-supply means upwardly through the tertiary structure to the receiving tank, with the last two flows providing means for regenerating the beds of the tertiary structure.

4,100,071

APPARATUS FOR THE TREATMENT OF LIQUIDS

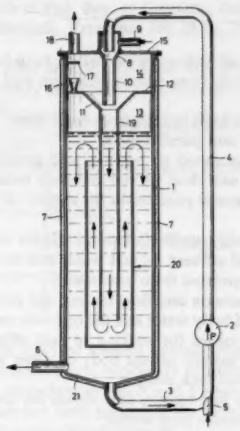
Peter Beurer, Winterthur; Johannes Lüthi, Neftenbach, and Libero Portaleoni, Kollbrunn, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 3, 1976, Ser. No. 747,329

Claims priority, application Switzerland, Dec. 10, 1975, 16027/75

Int. Cl.[2] C02C *5/04*

U.S. Cl. 210—197 **7 Claims**



1. An apparatus for the treatment of liquids and/or mixtures of liquids and solids, said apparatus comprising

a container defining a mixing chamber;

a hydraulic conveying means for conveying a forced through-flow of a liquid and/or a mixture of liquids and solids through said container;

a system of conduits connected between said container and hydraulic conveying means to define a closed circuit for circulating the flow therebetween, one of said conduits having a cross-section smaller than the cross section of said container;

a gas supply means located in said one conduit for delivering a flow of gas thereto to mix with said through-flow;

a foam collecting chamber in said mixing chamber;

a foam breaking chamber in communication with said foam collecting chamber to receive a flow of foam therefrom;

a partition separating said foam breaking chamber from said foam collecting chamber;

at least one impact plate in said foam breaking chamber for breaking up foam bubles impinging thereon from said mixing chamber;

an ejector communicating said foam breaking chamber with said mixing chamber to return fine bubbled foam to said mixing chamber from said foam breaking chamber;

at least one conduit of said system of conduits being disposed within said container for feeding the mixed flows of liquid and gas into said mixing chamber with said ejector communicating with said one conduit to deliver fine bubbled foam thereto; and

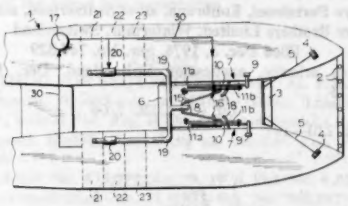
at least one foam accelerating device in said partition in spaced opposition to a respective impact plate.

4,100,072

EFFLUENT OIL COLLECTING VESSEL

Shoji Uchida, Nagayo; Hiroshi Takeshita, and Shozo Yamazaki, both of Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1977, Ser. No. 787,453
Claims priority, application Japan, May 10, 1976, 51-58991
Int. Cl.[2] E02B 15/04
U.S. Cl. 210—242 S 6 Claims



1. An effluent oil collecting vessel of twin-hull type for collecting effluent oil from a body of water, said vessel comprising:

parallel flotation hulls spaced from each other;

a float between said parallel hulls;

linkage means mounted on both of said parallel hulls and connected to said float for continuously maintaining said float is a horizontal position on the surface of said body of water;

tank means in said parallel flotation hulls for receiving and separating said effluent oil and water and for storing said effluent oil separated from said water;

suction pipe means on said float having one end open at the surface of said body water and the opposite end connected to said tank means for sucking in said effluent oil and water on the surface of said body of water and carrying the same to said tank means;

ejector means in said suction pipe means for creating a suction in said suction pipe means;

oil converging means at the forward end of said float for converging the flow of effluent oil and water between said parallel hulls toward said suction pipe means on said float;

a plurality of flexible guide means attached at only one end to said parallel hulls and extending into the space between said hulls in front of said oil converging means at approximately the surface of said body of water for blocking the spaces between said parallel hulls and said oil converging means and for directing said oil and water between said parallel hulls towards said oil converging means;

high pressure water ejector means directed toward said oil converging means and said suction pipe means for directing high pressure water against said oil converging means and for enhancing the flow of effluent oil and water between said parallel hulls in said oil converging section toward said suction pipe means; and

high water supply means connected to said high pressure water ejector means, said ejector means and said tank means for taking water from said tank means and supplying high pressure water to said high pressure water ejector means and said ejector means.

4,100,073

WASTE-WATER TREATMENT SYSTEM

Francis J. Hopcroft, 56 Prospect St., Norwood, Mass. 02062

Filed Jul. 6, 1976, Ser. No. 702,959
Int. Cl.[2] C02C 5/10
U.S. Cl. 210—532 S 2 Claims

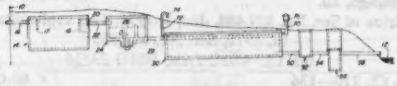
1. A wastewater treatment system including,

(a) an anaerobic septic tank having an inlet adapted to receive raw wastewater including solid and liquid waste components and a first outlet conduit at the upper portion of said septic tank for discharging effluents therefrom, said septic tank providing primary anaerobic treatment of said wastewater,

(b) a dosing chamber connected to said first outlet conduit of said septic tank whereby the effluent discharge of said septic tank is delivered to said dosing chamber for temporary storage therein, said dosing chamber including automatic dosing means for discharging a predetermined volume of liquid collected in said dosing chamber, and a second outlet conduit connected to said dosing means for discharging liquids therefrom,

(c) a gravity filter connected to said second outlet conduit for removing solid particles suspended in the liquid discharged from the dosing chamber and for enhancing aerobic decomposition of said solid particles,

(d) said filter including an enclosure and a filter bed disposed within said enclosure, said enclosure including top, bottom and side walls and connected at the top thereof to said



second outlet conduit, a third outlet conduit connected to the bottom of said enclosure, said filter bed including an upper stratum of peastone, a middle stratum of sand, and a bottom stratum of peastone, the top surface of said upper stratum being spaced from said top wall to define a void therebetween coextensive with the top of the filter and said top wall, at least a pair of spaced atmospheric vents connected to the upper portion of said enclosure, communicating with said void, and adapted to automatically and continuously circulate fresh air across the top surface of said filter, and distribution means connected to said second outlet conduit and adapted to distribute the liquid discharged from said dosing chamber over the top of said filter bed, and collection means at the bottom of said filter connected to said third outlet conduit for collecting filtered effluent, and,

(e) disinfection means connected to said third outlet conduit for disinfecting filtered liquid.

4,100,074

ANTIMONY TRIOXIDE COMPOSITION AND PROCESS OF PRODUCING THE SAME

Nobuyoshi Abe, Urawa; Shigenaga Kubo, Tokyo, and Kiyoshi Kanamaru, Toda, all of Japan, assignors to Nippon Chemical Industrial Co., Ltd. and Toho Ganryo Kogyo Co., Ltd., both of Tokyo, Japan

Filed Aug. 5, 1976, Ser. No. 711,895
Claims priority, application Japan, Aug. 7, 1975, 50-95416
Int. Cl.[2] C09K 3/28
U.S. Cl. 252—8.1 24 Claims

1. An antimony trioxide composition of improved chemical and physical properties, including sulfide resistance, transparency and electrical insulation capability, which comprises antimony trioxide particles having on the surfaces thereof hydrous zirconium oxide in an amount of about 0.1 to about 5% by weight (as ZrO_2) of the total weight of said composition and fine amorphous silica in an amount of about 1 to about 20% by weight, said silica being coated on said particles as an outer contiguous, dense coating upon electron microscope observation.

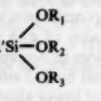
4,100,075

SILANE TREATED ANTIMONY COMPOUNDS

John Slocum Ashman, Euclid, and Anton Mudrak, Broadview Heights, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Jun. 23, 1977, Ser. No. 809,226
Int. Cl.[2] C09K 3/28
U.S. Cl. 252—8.1 12 Claims

1. A finely divided particulate inorganic antimony compound surface modified with up to about 5% by weight of an organosilane having the formula



wherein R_1, R_2 and R_3 are each independently hydrogen, lower alkyl, lower alkenyl, alkoxyalkyl aryl, lower alkylaryl, or lower arylalkyl groups, and R′ is an organo functional group.

8. A method for improving the flame-retardant properties of organic resins and elastomers comprising incorporating into said resin or elastomer, an amount of the surface modified antimony compound of claim 1 effective to improve the flame-retardant properties.

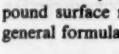
4,100,076

TITANATE TREATED ANTIMONY COMPOUNDS

John Slocum Ashman, Euclid; Gerald Dennis Burt, Shaker Heights, and Anton Mudrak, Broadview Heights, all of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

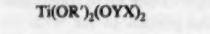
Filed Jun. 23, 1977, Ser. No. 809,227
Int. Cl.[2] C09K 3/28
U.S. Cl. 252—8.1 13 Claims

1. A finely divided particulate inorganic antimony compound surface modified with an organic titanate having the general formula



I)

wherein each R is independently an alkyl, aryl, cycloalkyl, or vinyl group containing from one to about 18 carbon atoms, or



II)

wherein X is oxygen or nitrogen,

Y is a two- or three-carbon atom chain, and

R′ is equal to R, H, or the ligand represented by XYOH.

8. A method of improving the flame-retardant properties of organic resins and elastomers comprising incorporating into said resin or elastomer, an amount of the surface-modified antimony compound of claim 1 which is effective to improve the flame-retardant properties.

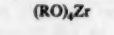
4,100,077

ZIRCONATE TREATED ANTIMONY COMPOUNDS

Gerald Dennis Burt, Shaker Heights, and Anton Mudrak, Broadview Heights, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Jun. 23, 1977, Ser. No. 809,228
Int. Cl.[2] C09K 3/28
U.S. Cl. 252—8.1 10 Claims

1. A finely divided particulate inorganic antimony compound surface-modified with an organic zirconate having the general formula



wherein each R is independently an aliphatic radical containing from one to about 18 carbon atoms.

6. A method of improving the flame-retardant properties of organic resins and elastomers comprising incorporating into said resin or elastomer, an amount of the surface-modified antimony compound of claim 1 which is effective to improve the flame-retardant properties.

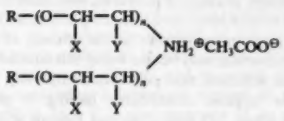
4,100,078

SECONDARY ETHERAMINE ACETATES AND THEIR USE AS LUBRICATING AGENTS FOR SYNTHETIC FIBERS

Rolf Kleber, Neu-Isenburg, and Willi Steckelberg, Hofheim, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 9, 1976, Ser. No. 748,968
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555896
Int. Cl. D06m 13/18
U.S. Cl. 252—8.9 4 Claims

1. Secondary etheramine acetates of the formula



1

in which R is alkyl or alkenyl having from 7 to 24 carbon atoms, cyclohexyl or aryl optionally substituted by alkyl having from 8 to 10 carbon atoms, X and Y represent hydrogen or methyl, but are not both methyl at the same time, and n is an integer in the range of from 2 to 20.

4,100,079

POLYMERS FOR ACID THICKENING

Gloria DiMarco Sinkovitz, Bridgeville, Pa., and Andrew Jackson Sharpe, Jr., Cheshire, Conn., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1977, Ser. No. 772,051
Int. Cl.[2] E21B 43/27
U.S. Cl. 252—8.55 C 7 Claims

1. A method of fracturing a subterranean formation comprising:

a. contacting said formation with an aqueous fracturing fluid which contains an acid which is capable of reacting with subterranean carbonate formations and as a thickening agent therefore at least 0.5 percent by weight of the acid and water of a copolymer having a molecular weight of at least 5,000, said copolymer containing from about 50 to about 98 weight percent dimethyl diallyl ammonium chloride and from about 2 to about 50 weight percent of a monomer capable of postreaction after polymerization to provide branching or partial crosslinking said monomer being selected from the group consisting of N-methylolacrylamide and diacetone acrylamide;

b. applying sufficient pressure to the said fracturing fluid to fracture said formation; and

c. maintaining said pressure while forcing said fracturing fluid into said fracture.

4,100,080

GREASES CONTAINING BORATE DISPERSIONS AS EXTREME-PRESSURE ADDITIVES

John Howard Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 14, 1977, Ser. No. 777,367
Int. Cl.[2] C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—18 5 Claims

1. In a grease having extreme-pressure properties comprising an oil of lubricating viscosity, thickened to grease consistency with an organic grease thickener, the improvement comprising the addition of a minor portion sufficient to impart extreme-pressure properties of a dispersion of hydrated potassium borate having a mean particle size of less than one micron and a boron to potassium ratio of about 2.5 to 4.5.

2. The grease of claim 1 in which the thickener is a lithium soap.

4,100,081

POLYUREA-BASED EXTREME PRESSURE GREASE

John L. Dreher, El Cerrito, and Richard E. Crocker, Novato, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 14, 1977, Ser. No. 777,365
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—25 6 Claims

1. A grease comprising a major portion of an oil of lubricating viscosity, a minor portion of polyurea, sufficient to thicken said oil to grease consistency, and a minor portion, sufficient to impart extreme-pressure properties to the grease, of a potassium or sodium triborate, said borate being introduced into the grease in aqueous solution, said polyurea comprising a water- and oil-insoluble organic compound having a molecular weight between about 375 and 2500 and having at least one ureido group.

4,100,082

LUBRICANTS CONTAINING AMINO PHENOL-DETERGENT/DISPERSANT COMBINATIONS

Donald Lynn Clason, Mentor; John Francis Pindar, Euclid, and Jerome Martin Cohen, University Heights, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jan. 28, 1976, Ser. No. 653,177
Int. Cl.[2] C10M *1/40, 1/54, 1/32, 3/34*
U.S. Cl. 252—33.4 23 Claims

1. A lubricant composition for two-cycle engines comprising a major amount by weight of at least one oil of lubricating viscosity and a nitrogen-containing organic composition comprising a combination of:

(A) about 2 to about 30% (based on the oil composition) of at least one amino phenol of the formula

$$(R)_a\text{—}Ar\text{—}(NH_2)_b$$
$$|$$
$$(OH)_c$$

wherein R is a substantially saturated, hydrocarbon-based substituent of at least 10 aliphatic carbon atoms; *a, b* and *c* are each independently an integer of one up to three times the number of aromatic nuclei present in Ar with the proviso that the sum of *a, b* and *c* does not exceed the unsaturated valences of Ar; and Ar is an aromatic moiety which is substituted by 0–3 substitutents selected from the group consisting of lower alkyl, lower alkoxyl, nitro, halo or combinations of two or more of said substituents; and

(B) about 1 to about 30% (based on the oil composition) of at least one detergent or dispersant, said detergent or dispersant being

(I) at least one neutral or basic metal salt of an organic sulfur acid, phenol or carboxylic acid.

7. A lubricant composition for two-cycle engines comprising a major amount by weight of at least one oil of lubricating viscosity and a nitrogen-containing organic composition comprising a combination of:

(A) about 2 to about 30% (based on the oil composition) of at least one amino phenol of the formula

$$(R)_a\text{—}Ar\text{—}(NH_2)_b$$
$$|$$
$$(OH)_c$$

wherein R is a substantially saturated, hydrocarbon-based substituent of at least 10 aliphatic carbon atoms; *a, b* and *c* are each independently an integer of one up to three times the number of aromatic nuclei present in Ar with the proviso that the sum of *a, b* and *c* does not exceed the unsaturated valences of Ar; and Ar is an aromatic moiety which is substituted by 0–3 substituents selected from the group consisting of lower alkyl, lower alkoxyl, nitro, halo or combinations of two or more of said substituents; and

(B) about 1 to about 30% (based on the oil composition) of at least one detergent or dispersant, said detergent or dispersant being

(III) at least one acylated, nitrogen-containing compound having a substituent of at least 10 aliphatic carbon atoms and made by reacting a carboxylic acylating agent with at least one amino compound containing at least one

$$\text{—}NH$$
$$|$$

group, said acylating agent being linked to said amino compound through an imido, amido, amidine or acyloxy ammonium linkage.

17. A lubricant composition for two-cycle engines comprising a major amount by weight of at least one oil of lubricating viscosity and a nitrogen-containing organic composition comprising a combination of:

(A) about 2 to about 30% (based on the oil composition) of at least one amino phenol of the formula

$$(R)_a\text{—}Ar\text{—}(NH_2)_b$$
$$|$$
$$(OH)_c$$

wherein R is a substantially saturated, hydrocarbon-based substituent of at least 10 aliphatic carbon atoms; *a, b* and *c* are each independently an integer of one up to three times the number of aromatic nuclei present in Ar with the proviso that the sum of *a, b* and *c* does not exceed the unsaturated valences of Ar; and Ar is an aromatic moiety which is substituted by 0–3 **substituents selected from the group consisting of lower alkyl, lower alkoxyl, nitro, halo or combinations of two or more of said substituents; and**

(B) about 1 to about 30% (based on the oil composition) of at least one detergent or dispersant, said detergent or dispersant being

(IV) nitrogen-containing condensate of a phenol, aldehyde and amino compound having at least one —NH group.

4,100,083

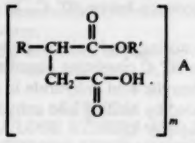
LUBRICANT COMPOSITIONS CONTAINING AN AMINE SALT OF A HALF ESTER OF SUCCINIC ACID

William R. Murphy, West Trenton, N.J., and Carleton N. Rowe, Yardley, PA, assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 474,494, May 30, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 637,922
Int. Cl.[2] C10M *1/26*
U.S. Cl. 252—34 10 Claims

1. A lubricant composition consisting essentially of a major amount of a lubricant selected from the group consisting of lubricating oil and a grease therefrom and an anti-fatigue

amount of an amine salt of a half ester of a succinic acid, the salt having the formula:



wherein *m* is 1 or 2, R is an alkyl or alkenyl group containing from 4 to 100 carbon atoms, R' is an alkyl group containing from 1 to 40 carbon atoms and A is (1) a hydrocarbyl monoamine or (2) a polyamine of the formula:

$$NH_2CH_2CH_2(R''NH)_xNH_2$$

wherein R'' is an alkylene group of from 1 to 10 carbon atoms and *x* is zero to 10.

4,100,084

PREPARATION OF OVERBASED METAL NAPHTHENATE LUBRICATING OIL COMPOSITIONS

William J. Powers, III, Port Arthur, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Feb. 9, 1977, Ser. No. 767,000
Int. Cl.² C10M *1/24, 3/18, 5/16, 0/22*
U.S. Cl. 252—39 **4 Claims**

1. A method of preparing a clarified overbased metal naphthenate lubricating oil composition comprising contacting a reaction mixture of a metal naphthenate reactant having a metal ratio of from about above 1 to 10, an alkaline earth metal hydroxide, a hydrocarbon lubricating oil and an alcohol selected from the group consisting of alkanols and alkoxyalkanols having from 1 to 5 carbon atoms with carbon dioxide at a temperature between about 140° and 155° F., allowing the mixture to stand in an air blanketed vessel for 1 to 100 hours; subsequently filtering the resultant naphthenate product and recovering said clarified overbased metal naphthenate composition from the filtrate, said metal naphthenate being derived from naphthenic acid of a molecular weight between about 230 and 600, said contacting employing between about 1 and 10 moles of hydroxide per mole of said metal naphthenate reactant, between about 0.75 and 1.1 moles CO_2 per mole of hydroxide, said hydrocarbon lubricating oil being present in a weight ratio of between about 1:1 and 6:1 diluent oil to metal naphthenate reactant, and said alcohol being present in a weight ratio of between about 1:2 and 1:6 alcohol to naphthenate reactant.

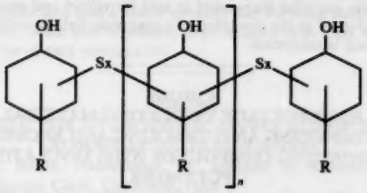
4,100,085

PROCESS FOR THE PREPARATION OF ADDITIVES FOR LUBRICATING OILS

Andrea Peditto, Turin; Franco Fossati, Robassomero (Turin), and Vincenzo Petrillo, Cirie (Turin), all of Italy, assignors to Liquichimica Robassomero S.p.A., Milan, Italy

Filed Dec. 15, 1976, Ser. No. 750,696
Claims priority, application Italy, Dec. 24, 1975, 30779 A/75
Int. Cl.² C10M *1/54, 3/48, 5/28, 7/52*
U.S. Cl. 252—42.7 **6 Claims**

1. In a process for preparing a detergent additive for a lubricating oil, of the type in which an alkylphenolsulfide, having the formula:



wherein R is a C_8–C_{20} alkyl group, *x* had a value of between 1 and 2 and *n* is an integer of between 0 and 3, is reacted with calcium oxide or calcium hydroxide and carbonated with carbon dioxide, the improvement comprising carrying out the reaction in the presence of (1) a promoter selected from the group consisting of NH_3 and NH_4OH, and (2) a co-promoter which is a short chain alcohol having not more than 5 carbon atoms.

4,100,086

DISPERSANT AND LUBE OILS CONTAINING SAME

John M. Larkin, Austin, Tex., and Harry Chafetz, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,250
Int. Cl.² C10M *1/32;* C08L *23/36*
U.S. Cl. 252—50 **7 Claims**

1. A composition of matter useful as a lubricating oil additive consisting of the reaction product of halogenated polyalkylenes having a molecular weight ranging from about 300 to 5000 or copolymers thereof and an excess of an unsaturated nitrogen containing heterocycle reacted at a temperature of around 80 to 160° C in the presence of an alkali or alkaline earth metal salt; the amount of heterocycle reacted being in excess of 1.5 to 30 moles per mole of said halogenated polyalkylenes with the amount of said metal salt being in an amount ranging from 0.2 to 3.0 moles per mole of said polyalkylenes.

4,100,087

PRESSURE-FIXING MAGNETIC DEVELOPER CONTAINING HYDROGENATED POLYSTYRENE BINDER FOR ELECTROSTATIC PHOTOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Hiroshi Takayama, Moriguchi, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Jan. 11, 1977, Ser. No. 758,423
Claims priority, application Japan, Jan. 22, 1976, 51/5477
Int. Cl.² G03G *9/14*
U.S. Cl. 252—62.1 P **18 Claims**

1. A pressure fixing developer for electrostatic photography comprising a finely divided magnetic material and a binder as effective components and consisting essentially of substantially spherical particles of said finely divided magnetic material dispersed in a solid medium of said binder, said binder medium being composed of a resin composition comprising (a) 25 to 65% by weight based on the total binder of a hydrogenated styrene resin, (b) 5 to 45% by weight based on the total binder of a wax having a melting point of at least 60° C. and (c) 10 to 30% by weight based on the total binder of a copolymer of an olefin with a carbonyl group-containing, ethylenically unsaturated monomer.

4,100,088

IMAGING COMPOSITION

Werner E. L. Haas, Webster, and Gary A. Dir, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1976, Ser. No. 702,362
Int. Cl.² G01N *27/00*
U.S. Cl. 252—62.52 **9 Claims**

1. An imaging composition consisting essentially of a ferro-

fluid and metal flakes, said metal flakes being detached from magnetic particles suspended in said ferrofluid and capable of being aligned in the direction of a magnetic field to which said ferrofluid is subjected.

4,100,089

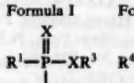
HIGH-VOLTAGE INSULATING MATERIAL COMPRISING ANTI-TRACKING AND EROSION INHIBITING COMPOUNDS WITH INSULATING POLYMERS

Travers Kregg Cammack, II, Union City, and David Dolph Nyberg, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

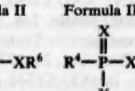
Filed Jan. 16, 1976, Ser. No. 649,797
Int. Cl.[2] H01B *3/00*
U.S. Cl. 252—63 **36 Claims**

1. A high-voltage electrically insulating material comprising at least one polymer and a composition comprising an additive effective in reducing tracking and a compound selected from the group consisting of nickel phosphate, a compound of Formula I, a compound of Formula II, a compound of Formula III and mixtures thereof;

Formula I



Formula II



Formula III

wherein each X is independently selected from oxygen or sulfur and wherein R^1 through R^6 can be the same or different and are independently selected from hydrogen or an organic group bound to P or X by carbon and wherein R^3, R^5 and R^6 can independently be a metallic or ammonium cation.

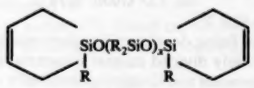
4,100,090

ELECTRICAL DEVICES CONTAINING SILACYCLOPENTENE DIELECTRIC FLUIDS

William T. Brooks, and Gary E. Legrow, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 5, 1977, Ser. No. 794,272
Int. Cl.[2] H01B *3/46, 3/24, 3/20*
U.S. Cl. 252—63.7 **13 Claims**

1. In an electrical device containing a dielectric fluid, the improvement comprising employing as the dielectric fluid a siloxane having the general formula



wherein each R is independently selected from the group consisting of methyl, phenyl, chloropropyl, and 3,3,3-trifluoropropyl radicals, and x is an integer.

4,100,091

PROCESS AND MEANS FOR ABSORBING AND RELEASING THERMAL ENERGY BY UTILIZING THE ALLOTHOPIC CHANGE OF ENDO-5-NORBORNENE-2, 3-DICARBOXYLIC ACID ANHYDRIDE WITH HEAT

Justin C. Powell, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,962
Int. Cl.[2] C09K *5/00*
U.S. Cl. 252—70 **5 Claims**

1. A process for absorbing, storing and releasing thermal energy which comprises exposing anisotropic, orthorhombic, endo-5-norbornene-2,3-di-carboxylic acid anhydride crystals to heat at a temperature in the range of 93°–160° C to cause absorption of heat energy accompanied by an allotropic change to another crystalline state at said temperature, storing said crystals at a temperature above 40° C and cooling said crystals at a temperature below 40° C., to release the stored energy.

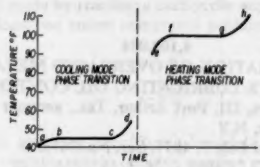
5. Material for storing, and releasing thermal energy at a temperature above 30° C consisting essentially of endo-5-norbornene-2,3-dicarboxylic acid anhydride in an allotropic crystalline state produced by heating said anhydride to a temperature of about 93° to 160° C.

4,100,092

DUAL TEMPERATURE THERMAL ENERGY STORAGE COMPOSITION FOR HEAT PUMPS

Hans O. Spauschus, Prospect, and Leopold Loeb, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 705,808, Jul. 16, 1976, abandoned. This application Apr. 20, 1977, Ser. No. 789,087
Int. Cl.[2] C09K *5/06; F25B 29/00, 13/00*
U.S. Cl. 252—70 **16 Claims**



1. A thermal energy storage material comprising at least two dissimilar, non-reactive paired organic constituents in a mixture, one of said constituents having a phase change transition temperature in the range of between about 35° F. and about 55° F. and the other having a phase change transition temperature in the range of between about 90° F. and about 130° F., each phase change transition temperature for one constituent occurring in mixture with the other constituent, said mixture consisting of paired constituents selected from one member of a group consisting of (a) a low m.p. C_{14}-C_{16} straight chain paraffin oil paired with a high m.p. paraffin or hydrocarbon wax (oil/wax); (b) a C_8 fatty acid paired with an acid selected from one member of the group consisting of a C_{14}-C_{18} fatty acid (acid/acid); (c) an alcohol selected from one member of the group consisting of a C_{10}-C_{12} alcohol paired with an acid selected from one member of the group consisting of a C_{14}-C_{18} fatty acid (alcohol/acid); and (d) an alcohol selected from one member of the group consisting of a C_{10}-C_{12} alcohol paired with a paraffin or hydrocarbon wax (alcohol/wax).

4,100,093

COMPOSITIONS FOR THE TREATMENT OF GLASS SURFACES

Giorgio Rialdi, via Padre Semeria 18, Genova, Italy

Filed Oct. 4, 1976, Ser. No. 729,156
Claims priority, application Italy, Apr. 1, 1976, 21827 A/76
Int. Cl.[2] C11D *7/24, 7/50*
U.S. Cl. 252—89 R **3 Claims**

1. A glass surface treating composition which comprises, in intimate admixture:

(a) 0.2–0.5% of a polyisopropylene gum;

(b) 18–25% of a monovalent saturated alcohol having from 3 to 4 carbon atoms;

(c) 9–13% of a liquid hydrocarbon having a boiling point of from 31° C to 36.2° C. and being capable of solubilizing said polyisopropylene gum and maintaining said gum in solution;

(d) 4–8% of a fatty compound selected from the group

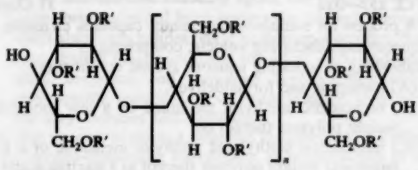
consisting of castor oil, hydrogenated castor oil and polymerized castor oil;
(e) 2–6% of silica gel;
(f) 0.05–0.2% of ammonium hydroxide; and
(g) 40–60% of water,
all percentages being expressed in parts percent by weight.

4,100,094
NOVEL CELLULOSE ETHERS AND DETERGENT COMPOSITIONS CONTAINING SAME

Michael E. Burns, West Chester, and Hans J. Pracht, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 654,431, Feb. 2, 1976, Pat. No. 4,048,433. This application Jun. 13, 1977, Ser. No. 805,946
Int. Cl.[2] C11D *1/02, 1/66, 1/94*
U.S. Cl. 252—89 R **17 Claims**

1. A detergent composition having soil release propertic. consisting essentially of (a) from 5% to 65% by weight of a water-soluble organic surfactant selected from the group consisting of nonionic, anionic, ampholytic and zwitterionic surfactants and mixtures thereof; (b) from 0.1% to 5% by weight of a methyl cellulose ether having the structure



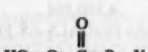
wherein R′ is hydrogen or methyl provided the average degree of methyl substitution on the anhydroglucose unit is from 1.8 to 2.7, n ranges from 14 to 54 and having a molecular weight of from 3,000 to 10,000; and (c) the balance detergency adjunct materials.

4,100,095
PEROXYACID BLEACH COMPOSITION HAVING IMPROVED EXOTHERM CONTROL

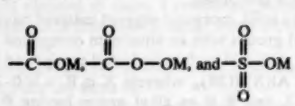
James Peyton Hutchins, Springfield Township, Hamilton County; Donald Victor Julian, Colerain Township, Hamilton County, and Michael Eugene Burns, Union Township, Butler County, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 27, 1976, Ser. No. 718,282
Int. Cl.[2] C11D *7/18*
U.S. Cl. 252—99 **6 Claims**

1. A dry, granular bleach composition consisting essentially of:
(1) boric acid, and
(2) a peroxyacid compound of the formula



wherein
(a) R is selected from the group consisting of an alkylene group containing from 1 to about 20 carbon atoms and phenylene, and
(b) Y is selected from the group consisting of hydrogen, halogen, alkyl, aryl,



wherein M is selected from the group consisting of hydrogen and a water-soluble, salt-forming cation;
wherein boric acid is present in an amount of at least 50% or more of said peroxyacid.

4,100,096
CLEANER FOR HYDROPHILIC METAL SURFACES OF LITHOGRAPHIC DUPLICATORS

Jack C. Rubin, Westchester, Ill., assignor to Addressograph Multigraph Corp., Cleveland, Ohio

Filed Jun. 4, 1976, Ser. No. 692,894
Int. Cl.[2] C11D *3/14, 7/08;* **C23G** *1/02*
U.S. Cl. 252—145 **5 Claims**

1. The process of cleaning lithographic ink deposits from metal surfaces of a lithographic duplicator which comprises rubbing the surface to be cleaned with a composition consisting essentially of an aqueous dispersion containing about 6 percent to 25 percent by weight of levigated alumina of particle size smaller than 25 microns, about 0.02 percent to 0.25 percent by weight of a water miscible, acid stable, non-cationic surfactant, about 8 percent to 15 percent by weight of aluminum sulfate and an acid present in an amount sufficient to maintain the pH of the dispersion in the range of 0.65 to 0.75, and thereafter removing from the cleaned surface any residue of said composition.

3. A composition for cleaning the hydrophilic metal surfaces of lithographic duplicators consisting essentially of an aqueous dispersion containing about 6 percent to 25 percent by weight of levigated alumina of particle size smaller than 25 microns, about 0.02 percent to 0.25 percent by weight of a water miscible, acid stable, non-cationic surfactant, about 5 percent to 15 percent by weight of aluminum sulfate and an acid present in an amount sufficient to maintain the pH of the dispersion in the range of 0.65 to 0.75.

4,100,097
LOW pH DETERGENT BAR

James R. O'Roark, Dayton, Ohio, assignor to The Hewitt Soap Company, Inc., Dayton, Ohio

Filed Feb. 2, 1977, Ser. No. 764,875
Int. Cl.[2] C11D *1/28, 3/22, 17/00*
U.S. Cl. 252—145 **11 Claims**

1. A milled synthetic detergent bar providing a pH of from about 4 to about 7 at a use concentration of about 1% by weight in water and consisting essentially of (a) from about 20% to about 40% by weight of a synthetic detergent selected from the group consisting of coconut-oil fatty acid ester of sodium isethionate and sodium lauryl sulfoacetate and mixtures thereof; (b) from about 15% to about 25% by weight of paraffin; (c) from about 7.5% to about 13.5% by weight powdered starch; (d) from about 12.5% to about 25% by weight dextrin; (e) coconut-oil fatty acid in an amount up to about 2.5% by weight to improve plasticity of the paraffin and to improve sudsing performance; (f) from about 9.0% to about 14.5% by weight water; (g) from about 0.5% to about 5% microcrystalline wax; (h) from about 0.5% to about 5% by weight lauric diethanolamide; and (i) lactic acid to adjust the pH.

4,100,098
STABILIZED SOLUTIONS OF SODIUM DITHIONITE

Phillip R. Magan, Lawrenceville, Ga., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 26, 1976, Ser. No. 735,356
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—188 **7 Claims**

1. A method of stabilizing aqueous solutions of mixtures of sodium dithionite and sodium sulfite which comprises:
(a) preparing an aqueous solution containing greater than about 13 percent by weight of of sodium dithionite and at least one percent of sodium sulfite by weight of said sodium dithionite,
(b) adding potassium hydroxide to said aqueous solution of

an amount sufficient to provide a residual of potassium hydroxide in the solutions of from about 1 to about 12 grams per liter,

(c) maintaining the aqueous solution at a temperature of from about 0° to about 15° C.

4,100,099

QUATERNARY SALT-POLYAMINE INHIBITOR FOR SOUR GAS CONDITIONING SOLUTIONS

Robert G. Asperger, and Robert C. Clouse, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1977, Ser. No. 782,159
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—189 11 Claims

1. A sour gas conditioning solution inhibited against CO_2 and H_2S promoted corrosion of iron and steel by having dissolved therein an inhibiting concentration of a combination of one part by weight of a quaternary pyridinium salt and about 0.01-10 parts of a lower alkylenepolyamine, a corresponding polyalkylenepolyamine, or a mixture thereof wherein the alkylene units contain 2-3 carbon atoms.

4,100,100

COBALT-CONTAINING INHIBITOR FOR SOUR GAS CONDITIONING SOLUTIONS

Robert C. Clouse, and Robert G. Asperger, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1977, Ser. No. 782,253
Int. Cl.[2] C23F *11/18;* B01D *47/02, 53/34*
U.S. Cl. 252—189 10 Claims

1. A sour gas conditioning solution inhibited against CO_2 promoted corrosion of iron and steel by having dissolved therein an inhibiting concentration of a combination of one part by weight of a quaternary pyridinium salt and about 0.001–10 parts of a thio compound which is a water-soluble thiocyanate or an organic thioamide, and, in addition to the above, a small but effective amount of cobalt, said cobalt present as a dissolved divalent cobalt compound.

4,100,101

EUROPIUM-ACTIVATED ALKALINE EARTH FLUOROHALIDE X-RAY PHOSPHORS AND METHOD FOR PREPARING THE SAME

Russell F. Messier, Ulster, and Robert W. Wolfe, Wysox, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 614,836, Sep. 19, 1975, abandoned. This application Jun. 21, 1976, Ser. No. 698,058
Int. Cl.[2] C09K *11/46*
U.S. Cl. 252—301.4 H 6 Claims

1. A europium-activated x-ray phosphor composition of the formula:

$$Ba_{1-x}Sr_xFH:yEu$$

wherein x is from about 0 to about 0.5, y is from about 0.001 to about 0.100 and H is a halogen selected from the chlorine and bromine, characterized in that europium is present in the trivalent state in an amount of at least 1 percent of the amount of europium in the divalent state.

4,100,102

COMPOSITION FOR SCREENING INFRA-RED RADIATION

Roy E. Shaffer, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 35,380, Jun. 10, 1960. This application Apr. 6, 1965, Ser. No. 486,247
Int. Cl.[2] C09K *3/30*
U.S. Cl. 252—305 1 Claim

1. A composition for use in generating a protective aerosol, consisting essentially of a suspension of 30 to 40% by weight of aluminum particles in from 60 to 70% by weight of vaporizable hydrocarbon oil, said aluminum particles having diameters in the range of 2 to 20 microns and thicknesses of less than 3/10 micron.

4,100,103

CAPSULE MANUFACTURE

Peter L. Foris; Robert W. Brown, and Paul S. Phillips, Jr., all of Appleton, Wis., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 30, 1976, Ser. No. 755,830
Int. Cl.[2] B01J *13/02*
U.S. Cl. 252—316 17 Claims

1. A process for manufacturing minute capsules, en masse, in an aqueous manufacturing vehicle, comprising:

establishing an agitating aqueous system comprising

(A) melamine and formaldehyde,

(B) monomeric methylol melamine or a low molecular weight polymer thereof or

(C) monomeric methylated methylol melamine or a low molecular weight polymer thereof as a starting material or mixtures of any of said starting materials, about 0.4 to about 15 percent by weight, based on the weight of aqueous manufacturing vehicle, of a system modifier material selected from the group consisting of poly-(ethylene-co-maleic anhydride), poly(methyl vinyl ether-co-maleic anhydride), poly(acrylic acid), poly(-propylene-co-maleic anhydride), poly(butadiene co-maleic anhydride) and poly(vinyl acetate-co-maleic anhydride), and particles of an intended capsule core material substantially insoluble in the system, in which agitating system the modifier is present prior to the addition of said particles, whereby said starting material polycondenses to form a condensation polymer resulting in

(i) liquid-liquid phase separation of the resulting condensation polymer above a molecular weight to be soluble in the system and

(ii) continued polycondensation of the separated polymerization product to give solid capsule wall material individually surrounding particles of the dispersed intended capsule core.

4,100,104

CATALYTIC MATERIALS AS FOR OLEFIN POLYMERIZATION

Stanley J. Katzen, Cincinnati, and Louis J. Rekers, Wyoming, both of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 759,213
Int. Cl.[2] C08F *4/78;* B01J *31/14, 27/16, 21/12*
U.S. Cl. 252—428 10 Claims

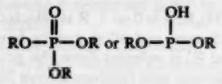
1. A process for the preparation of an olefin polymerization catalyst, which comprises:

(a) coating a solid, inorganic support material having surface hydroxyl groups with an aluminum compound capable of reacting with said surface hydroxyl groups and having the formula $Al(X)_a(OR)_b$, wherein X is R, a is 0–2, b is 1–3, $a+b$ is 3, and R is an alkyl group having from 1 to 8 carbon atoms in an amount sufficient to provide from 0.1

to 10% of aluminum by weight based on the weight of the support;

(b) calcining the support material having the aluminum compound coated thereon at temperatures of at least 200° F.;

(c) depositing on the support a chromium-containing compound capable of reacting with said surface hydroxyl groups and comprising an organophosphoryl chromium reaction product of chromium trioxide and an organophosphorus compound of the formula:



wherein R is hydrogen, or alkyl, aralkyl, aryl, or cycloalkyl, but at least one R is other than hydrogen in an amount sufficient to provide from about 0.25 to 2.5% of chromium by weight based on the weight of the support; and

(d) activating the thus treated support in a non-reducing atmosphere at temperatures of from 800° F. and up to the decomposition temperature of the support.

2. The process of claim 1, further comprising the step of:

(e) combining the activated, supported catalyst with a metallic or non-metallic reducing agent, the metallic reducing agent being selected from among the trialkyl aluminums, alkyl aluminum halides, alkyl aluminum alkoxides, dialkyl zinc, dialkyl magnesium, and the alkali metal and magnesium, beryllium and aluminum borohydrides, and the non-metallic reducing agent being selected from among the alkyl boranes and hydrides.

5. The process of claim 1, wherein the calcination is effected in an oxygen-containing atmosphere at temperatures of from 200° to 2000° F., and wherein the activation is carried out in an oxygen-containing atmosphere at temperatures of from 800° to 2000° F.

4,100,105

TITANIUM-MODIFIED SILYL CHROMATE CATALYSTS FOR ETHYLENE POLYMERIZATION

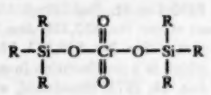
Isaac Jacob Levine, Somerville, and Frederick John Karol, Belle Mead, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,213

Int. Cl.[2] B01J *31/12, 27/06;* **C08F** *2/34*

U.S. Cl. 252—429 R **12 Claims**

1. A catalyst for the polymerization of ethylene alone or the copolymerization of ethylene with α-olefins containing 3 to 6 carbon atoms comprising an amount of a silyl chromate having the formula:



wherein each R is a hydrocarbyl radical containing from 1 to about 14 carbon atoms sufficient to afford about 0.05 to about 2.0 weight % of chromium calculated as Cr, based on the total weight of catalyst deposited onto a high surface area silica support containing about 0.01 % to about 50% by weight of aluminum, calculated as Al_2O_3, and about 2% to about 20% by weight of titanium, calculated as TiO_2, both based on the weight of silica, said support previously having been heat-treated to a temperature of about 500°-1000° C. prior to depositing the silyl chromate thereon.

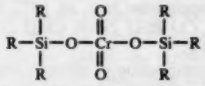
3. Catalyst claimed in claim 1 containing about 0 to about 10% by weight of a fluoridation agent based on the weight of silica.

9. Method of preparing an ethylene polymerization catalyst which comprises the steps of:

(A) Heating a high surface area silica support containing about 0.01% to about 50% by weight of aluminum, calculated as Al_2O_3, and about 2% to about 20% by weight of titanium, calculated as TiO_2 both based on the weight of silica to a temperature of about 500° to about 1000° C.,

(B) Cooling the silica support and

(C) Depositing on the cooled silica support an amount of a silyl chromate having the formula:



wherein each R is a hydrocarbyl radical containing from 1 to about 14 carbon atoms sufficient to afford about 0.05 to about 2.0 weight % of chromium calculated as Cr, based on the total weight of catalyst.

4,100,106

PROCESS FOR THE PRODUCTION OF A MIXED-OXIDE OXIDATION CATALYST CONTAINING VANADIUM AND PENTAVALENT PHOSPHORUS

Giancarlo Stefani, Bergamo, Italy, and Pietro Fontana, Schaffhausen, Switzerland, assignors to Lonza, Ltd., Basel, Switzerland

Filed Jan. 12, 1976, Ser. No. 648,025

Claims priority, application Switzerland, Jan. 10, 1975, 00266/75

Int. Cl.[2] B01J *27/14*

U.S. Cl. 252—437 **18 Claims**

1. The process for the production of a mixed-oxide oxidation catalyst, which, based on the vanadium and pentavalent phosphorus, has an atomic ratio of phosphorus to vanadium between 1.05 to 1 and 1.10 to 1, by reacting a salt of the tetravalent vanadium, dissolved in a concentrated non-oxidizing acid aqueous solution with orthophosphoric acid forming a vanadium-phosphorus-oxide-complex, isolating the complex, putting the dried complex into the desired form and subjecting the formed catalyst material to a heat treatment of at least 300° C., the improvement which comprises the step of isolating the vanadium-phosphorus-oxide-complex by precipitating the complex by adding water to the concentrated solution.

4,100,107

DESULFURIZATION OF FUEL GAS AT HIGH TEMPERATURE USING SUPPORTED MOLTEN METAL CARBONATE ABSORBENT

Ronald H. Wolk, San Jose, Calif.; William Rovesti, Columbia, S.C., and Peter Maruhnic, Pennington, N.J., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Division of Ser. No. 567,635, Apr. 14, 1975, Pat. No. 3,996,335. This application Nov. 28, 1975, Ser. No. 636,277

Int. Cl.[2] B01J *27/20;* **B01D** *47/00;* **C01D** *47/00*

U.S. Cl. 252—443 **4 Claims**

1. A sorbent material for removing sulfur from sulfur containing gases consisting essentially of, low surface area, macroporous, alumina support material having an SiO_2 content of less than 2 weight percent and porosity of at least 0.10 cc/gm, having at least 10 weight percent of an alkali metal carbonate interspersed within the pores of the refractory support material.

4,100,108

ZEOLITIC CATALYSTS AND METHOD OF PRODUCING SAME

Hamid Alafandi, Woodland Hills, and Dennis Stamires, Newport Beach, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 718,166, Aug. 27, 1976, and a continuation-in-part of Ser. No. 718,167, Sep. 9, 1976, Pat. No. 4,058,484. This application Mar. 30, 1977, Ser. No. 782,971

Int. Cl.[2] B01J *29/06*; C10G *11/02*

U.S. Cl. 252—455 Z 11 Claims

1. A catalytic composition of matter comprising: a mixture of a zeolite of the faujasite type having a sodium content, expressed as Na_2O from about 2.5% to about 5% and a zeolite of the faujasite type having a sodium content of less than about 2.5% and less than said first named zeolite, the weight ratio of the first named zeolite to the second named zeolite being in the range of from about 1. part by weight of the first named zeolite to 4 parts by weight of the second named zeolite to 4 part by weight of first named zeolite to 1. part by weight of the second named zeolite, said mixture being combined with a matrix and the combination having a sodium content expressed as Na_2O of about 0.1 to about 1.5% on a volatile free basis.

4,100,109

CATALYST AND A PROCESS FOR THEIR PREPARATION

Alain Muller, Le Havre, France, assignor to Compagnie Francaise de Raffinage, Paris, France

Filed Dec. 7, 1976, Ser. No. 748,303

Claims priority, application France, Dec. 8, 1975, 75 37507

Int. Cl.[2] B01J *21/04, 23/28, 23/30, 23/74*

U.S. Cl. 252—465 33 Claims

1. Catalyst comprising in combination (1) a carrier formed of an intimate mixture of aluminum oxide and nickel oxide, said carrier having been obtained by co-precipitating a gel from a solution of an organic salt of aluminum and an aqueous solution containing nickel, said co-precipitation being followed by drying and by calcination of said gel, and (2) an active phase on said carrier comprising at least one metal selected from groups VIII and VIB of the Periodic Table of the elements.

4,100,110

ISOLONGIFOLENE PRINS REACTION COMPOUNDS IN PERFUMERY

Hifzur Rahman Ansari, Rayleigh; Neville Unwin, Surbiton, and Horst Richard Wagner, Woodford Green, all of England, assignors to Bush Boake Allen Limited, London, England

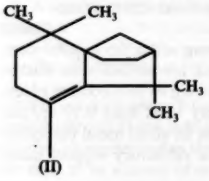
Filed Aug. 11, 1975, Ser. No. 603,908

Claims priority, application United Kingdom, Aug. 9, 1974, 25244/74

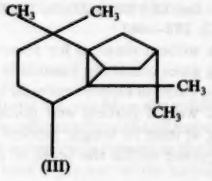
Int. Cl.[2] C11B *9/00*

U.S. Cl. 252—522 24 Claims

1. A compound having the formula XY, wherein X is a polycyclic monovalent radical selected from the group consisting of II, III and IV:



(II)



(III)

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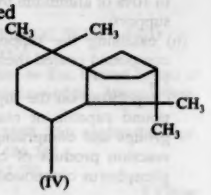


(IV)

Y is —C(OR'$_n$) (H)$_n$R, n is 0 or 1, R is selected from the group consisting of hydrogen and alkyl groups having from 1 to 5 carbon atoms and R' is selected from the group consisting of hydrogen and alkanoic acid residues having from 1 to 6 carbon atoms.

4,100,111

CURABLE MIXTURES

Heinz Peter, Rheinfelden, Switzerland; Dieter Reinehr, Wittlingen, Germany, and Eduard Troxler, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

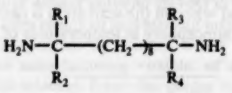
Filed Oct. 29, 1975, Ser. No. 626,896

Claims priority, application Switzerland, Nov. 7, 1974, 14891/74

Int. Cl.[2] C08G *59/50*

U.S. Cl. 528—116 14 Claims

1. Curable mixtures which are suitable for the manufacture of mouldings, impregnated materials, coatings, lacquers and sealings, characterised in that they contain (a) a compound having more than one epoxy group and (b), as the curing agent, at least one 1,10-diaminodecane of the formula I



(I)

wherein R_1 and R_3 independently of one another represent an alkyl, cycloalkyl, aralkyl, phenyl or naphthyl group and R_2 and R_4 independently of one another represent hydrogen, alkyl, cycloalkyl, aralkyl, phenyl or naphthyl group or R_1 and R_2 and/or R_3 and R_4, conjointly with the carbon atom to which they are linked, form a 5-membered to 12-membered alkylene or oxaalkylene ring.

4,100,112

PROCESS FOR THE PRODUCTION OF AMINE SILICATE COMPOUNDS AND THEIR RESINOUS CONDENSATION PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 652,338, Jan. 26, 1976, which is a continuation-in-part of Ser. No. 559,313, Mar. 17, 1975, Pat. No. 3,979,362, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application May 19, 1977, Ser. No. 798,329

Int. Cl.[2] C08G *77/04*

U.S. Cl. 260—185 17 Claims

1. The process for the production of amine silicate compounds by the following steps:

(a) mixing about 20 parts by weight of a fine granular hydrated silica, 20 to 40 parts by weight of an amine compound, selected from the group consisting of ammonium hydroxide, methylamine, ethylamine, propylamine, isopropylamine, butylamine, amylamine, hexylamine, aniline, toluidine amine, xylidine amine, naphthylamine, benzylamine, phenylenediamine, ethylenediamine, tetramethylenediamine, pentamethylenediamine, decamethylenediamine, xylylenediamine, piperazine, diethylenetriamine, triethylenetetramine tetraethylenepentamine, tolylene diamine, aminocaproic acid, caprolactam, aminoacetic

acid, aminobenzoic acid, aminosuccinic acid, 2-aminopyridine, 2-amino-1-butanol, 2-aminoethanol, 1-amino-2-propanol, o-aminophenol, p-aminophenol, 6-amino-2-picoline, 2-amino-4-nitrophenol, and mixtures thereof, and 50 to 100 parts by weight of water;

(b) adding an alkali catalyst in the proportion of 1% to 10% by weight, weight based on the weight of hydrated silica and the amine compound;

(c) heating said mixture to 80° to 150° C while agitating until most of the water is evaporated, replacing any evaporated amine, then heating is continued at 80° to 150° C for 30 to 60 minutes, thereby

(d) producing amine silicate compounds.

8. The process of claim 1 wherein additional steps are added following step (d) to produce epoxy silicate resinous products by the following steps:

(e) mixing slowly 10 to 40 parts by weight of an epoxy compound selected from the group consisting of epichlorohydrin, glycidol, methyl epichlorohydrin, 1,2-epoxy-3-phenoxypropane, 3,4-epoxyethyl benzene, 1,2-epoxybutane, 1,2-epoxycyclohexane, epoxyethane, 1,2-epoxypropane, 1-chloro-2,3-epoxypropane, 1:2,3:4-diepoxybutane, 2:3,6:7-diepoxy-2,6-dimethyl-4-octene, epoxyethylbenzene, epichlorohydrin bisphenol A epoxy resin containing 2 or more reactive epoxy groups per molecule, epichlorohydrin diglycidyl ether of bisphenol epoxy resin containing 2 or more reactive epoxy groups per molecule, epichlorohydrin resorcinol epoxy resin containing 2 or more reactive epoxy groups per molecule and mixtures thereof, with about 20 parts by weight of the amine silicate compound as produced by the methods of claim 1;

(f) agitating the said mixture while keeping the temperature between 30° to 70° C at ambient pressure, thereby

(g) producing an epoxy silicate polymer;

(h) heating said epoxy silicate polymer to a temperature between 80° to 100° C, thereby

(i) producing an epoxy silicate resinous product.

4,100,113

ELECTROLYTIC CELL MEMBRANE AND METHOD OF PREPARATION BY PLASMA POLYMERIZATION OF POLYAMIDE OR POLYTETRAFLUOROETHYLENE THIN FILMS ONTO POLYMERIC SUBSTRATES

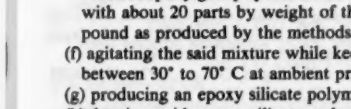
G. Howard McCain, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Apr. 1, 1976, Ser. No. 672,781

Int. Cl.[2] C25B *13/00*; C08F *2/46, 259/08*

U.S. Cl. 521—38 **5 Claims**

1. An improved hydraulically impermeable cation exchange membrane consisting essentially of: a substrate selected from the group of a film of copolymer having the repeating structural units of the formula

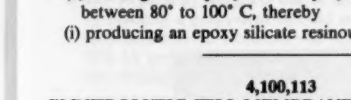


(I) $-CF_2-CF-$ and (II) $-CF_2-Cxx^1$

$(R)_n$

SO_3H

wherein R represents the group



$-CF-CF_2-O-(CFY-CF_2O)_m-$

R′

in which R′ is fluorine, or perfluoroalkyl of 1 to 10 carbon atoms; Y is fluorine or trifluoromethyl; *m* is 1, 2 or 3; *n* is 0 or 1; *x* is fluorine, chlorine or trifluoromethyl; and *x′* is *x* or CF_3 $-CF_2-_aO-$; wherein *a* is 0 or an integer from 1 to 5; the units of formula (I) being present in an amount to provide a copolymer having an $-SO_3H$ equivalent weight of about 1000 to 1400;

copolymers of tetrafluoroethylene and hexafluoropropylene having grafted thereon a 50-50 mixture of styrene and alpha methylstyrene which has been sulfonated; or

an insoluble, infusible copolymeric matrix formed from at least 20 percent by weight of a polyvinyl aromatic compound and not more than 80 percent of a monovinyl aromatic compound with a reinforcing material therein and no more than 70 percent by weight of a monovinyl aromatic compound without a reinforcing material therein, sulfonate groups chemically bonded to the aromatic nuclei of the matrix and a solvating liquid in gel relationship with the matrix, the sulfonate groups being present in an amount no more than four equivalents or sulfonate groups for each mole of polyvinyl aromatic compound and not less than one equivalent of sulfonate groups for each 10 moles of poly- and monovinyl aromatic compound the solvating liquid being at least 25 percent by volume of the resin; and

a top coating deposited upon the surface of at least one side of said substrate by plasma polymerization to produce a thin pinhole free coating in the range of 50 to 2000 Angstroms having a chemical makeup selected from the group of polyamide or polytetrafluoroethylene.

4,100,114

POLYURETHANE FOAM COMPOSITION

Reishi Naka; Toshikazu Narahara, and Junji Mukai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 30, 1975, Ser. No. 645,340

Claims priority, application Japan, Jan. 6, 1975, 50-45

Int. Cl.[2] C08G *18/06*; C08K *3/34*; C08L *75/04*

U.S. Cl. 521—175 **7 Claims**

1. A rigid polyurethane foam-containing composition which also contains 5 to 20% by weight of hollow-spherical amorphous natural vitreous Silas balloons having a particle size of 100 to 300μ, based on the total weight of polyol and isocyanate components of the polyurethane foam, and 0.2 to 2% by weight of an organosilane compound, based on the total weight of the polyol and isocyanate components of the polyurethane foam and said Silas balloons in the rigid polyurethane foam, said foam composition having a density of about 0.05 gram per cubic centimeter or less.

4,100,115

HIGH-TEMPERATURE INSULATION COMPOSITE MOLDED PRODUCT

Steven R. Baer, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 6, 1976, Ser. No. 712,310

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—83 **48 Claims**

1. A cellular high-temperature insulation composite molded product comprising the molded and cured product obtained by preparing a mixture of

(1) a dry blend of

(a) expanded perlite,

(b) a calcium aluminate cement,

(c) a refractory clay, and

(d) wollastonite, with

(2) an aqueous liquid composition comprising

(a) an auxiliary binder, and

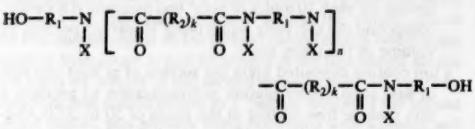
(b) water and molding and curing the mixture or allowing the mixture to cure.

4,100,116
POLYURETHANE FOAMS FROM POLYETHER POLYOLS WHICH CONTAIN AMIDE GROUPS

Jan Mazanek; Johannes Blahak, both of Cologne; Kuno Wagner, Leverkusen, and Heinz Ziemann, Leichlingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 14, 1976, Ser. No. 750,492
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559372
Int. Cl.[2] C08G *18/14, 18/50;* **C07C** *97/02, 102/06*
U.S. Cl. 521—167 **17 Claims**

13. Polyether diols containing amide groups in accordance with the following formula:



wherein

R_1 denotes identical or different alkylene groups having a molecular weight of between 148 and 40000 and containing at least two ether groups,

R_2 denotes divalent aliphatic, cycloaliphatic araliphatic or aromatic groups having from 1 to 15 carbon atoms and

X denotes hydrogen or a straight chain or branched chain C_1–C_6 alkyl group and

n represents an integer of between 0 and 100

k represents 0 or 1.

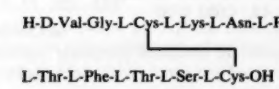
16. In a process for the production of polyurethane resins by reacting polyisocyanates with compounds containing isocyanate reactive hydrogen atoms optionally in the presence of chain lengthening agents having a molecular weight of from 32 to 400, blowing agents, catalysts and other additives, the improvement wherein the isocyanate reactive compounds comprise the product of a process wherein 10 to 95% of the hydroxyl groups of a polyether polyol, having a molecular weight of from about 150 to 40,000, are converted into amino or alkylamino or arylamino groups or mixtures thereof and wherein the resulting partially aminated polyether polyol is amidated by reaction with a compound selected from the group consisting of a polycarboxylic acid, a polycarboxylic acid ester, a polycarboxylic acid anhydride, a polycarboxylic acid halide or mixture thereof said compound having a functionality in the sense of the amidation reaction of from 2 to 4.

4,100,117
SOMATOSTATIN ANALOGS AND INTERMEDIATES THERETO

James E. Shields, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 21, 1977, Ser. No. 789,472
Int. Cl.[2] C08L *37/00;* **C07C** *103/52;* **A61K** *37/00*
U.S. Cl. 260—8 **10 Claims**

1. A compound selected from those of the formula



and its pharmaceutically acceptable non-toxic acid addition salts, and intermediates to said compounds, said intermediates having the formula R-D-Val-Gly-L-Cys(R_1)-L-Lys(R_2)-L-Asn-L-Phe-L-Phe-L-Trp(R_5)-L-Lys(R_2)-L-Thr(R_3)-L-Phe-L-Thr(R_3)-L-Ser(R_4)-L-Cys(R_1)-X; in which

R is hydrogen or an α-amino protecting group;

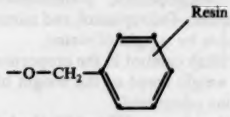
R_1 is hydrogen or a thio protecting group;

R_2 is hydrogen or an ε-amino protecting group;

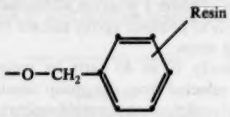
R_3 and R_4 each are hydrogen or a hydroxy protecting group;

R_5 is hydrogen or formyl; and

X is hydroxy or



in which the resin is polystyrene; with the proviso that, when X is hydroxy, each of R, R_1, R_2, R_3, R_4, and R_5 is hydrogen, and, when X is

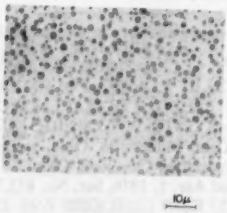


each of R, R_1, R_2, R_3, and R_4 is other than hydrogen.

4,100,118
THERMOSETTING RESIN COMPOSITION

Shun-ichi Numata, Hitachi; Hitoshi Yokono, Katsuta, and Junji Mukai, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 8, 1975, Ser. No. 620,760
Claims priority, application Japan, Oct. 11, 1974, 49-116105
Int. Cl.[2] C08G *73/06*
U.S. Cl. 260—18 PT **29 Claims**



14. A molded thermoset composition comprising a resin containing isocyanurate and oxazolidone rings produced by curing at a temperature in the range of 50° C to 250° C, a thermosetting resin consisting essentially of (a) one equivalent of a polyfunctional epoxy compound containing 10 to 80% by weight of a polyglycidyl ester obtained from a polymer or Diels-Alder adduct of an unsaturated fatty acid and an epihalohydrin, (b) 1.5 to 5 equivalents of a polyisocyanate compound, and (c) 0.01 to 10% by weight of a curing catalyst based on the total weight of the polyfunctional epoxy compound and the polyisocyanate compound, said curing catalyst being a basic catalyst capable of facilitating isocyanaurate and oxazolidone ring formation and being at least one member selected from the group consisting of a tertiary amine, an imidazole and a quaternary ammonium salt containing an alkyl group of 8 or more carbon atoms; an inorganic filler and a coupling agent, said molded thermoset composition exhibiting thermal resistance and thermal shock resistance and having a rigid resin part consisting mainly of the polyfunctional epoxy compound and the polyisocyanate compound in the form of a matrix and a flexible resin part consisting mainly of the polyglycidyl ester and the polyisocyanate compound uniformly distributed in the form of fine spheres in the matrix.

4,100,119

GREATER WATER RESISTANCE AND SHORTER DRYING TIME IN WATER SOLUBLE ENAMEL PAINTS

Michael A. Lerman, Park Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 20, 1975, Ser. No. 625,009
Int. Cl.[2] B32B *9/02, 15/08;* C08L *91/00, 93/00*
U.S. Cl. 260—22 CB 8 Claims

1. A water soluble polyester resin suitable as an ingredient in water soluble enamel paints comprising the reaction product of a fatty acid, trimethylol propane, isophthalic acid, trimellitic anhydride, and from 1 to 15 weight percent of a rosin-ester resin (based on the amount of polyester resin), said rosin-ester resin comprising the reaction product of rosin, maleic acid, and pentaerythritol.

5. A water soluble enamel point having good water resistance comprising the reaction product of ammonium hydroxide, water, a pH sensitive chelate of about 80 weight percent triethanolamine titanate in isopropanol, and a polyester resin comprising the reaction product of a fatty acid, trimethylol propane, isophthalic acid, trimellitic anhydride, and from 1 to 15 weight percent of a rosin-ester resin (based on the amount of polyester resin), said rosin-ester resin comprising the reaction product of rosin, maleic acid, and pentaerythritol.

4,100,120

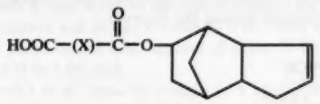
RESINOUS COMPOSITION

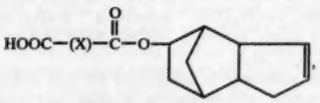
Iwao Maekawa; Isao Uchigasaki, and Sakato Kumazaki, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Mar. 1, 1977, Ser. No. 773,332
Claims priority, application Japan, Mar. 2, 1976, 51-22874
Int. Cl.[2] C09D *3/68*
U.S. Cl. 260—22 CB 16 Claims

1. A resinous composition comprising

1. 40 – 90 parts by weight of one or more oligomers obtained by reacting a polyvalent alcohol or its derivative with a fatty acid derived from oils and fats in an amount of 30 – 70% by mole based on the hydroxyl group of the polyvalent alcohol, and a monobasic acid of the formula,





wherein X is an α,β-unsaturated hydrocarbon group having 2 or 3 carbon atoms in an amount of 70 – 30% by mole based on the hydroxyl group of the polyvalent alcohol, and

2. 10 – 60 parts by weight of one or more polymerizable monomers having at least one polymerizable double bond in the molecule.

4,100,121

METAL ACETYL ACETONATE COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Turtle Creek, and David C. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 568,221, Apr. 15, 1975, Pat. No. 3,973,439.
This application Apr. 5, 1976, Ser. No. 674,004
Int. Cl.[2] C09D *3/58, 5/26;* G01K *1/00*
U.S. Cl. 260—23 EP 18 Claims

1. A thermoparticulating composition comprising at least one metal acetylacetonate and a solution in an organic solvent of a resinous carrier curable at room temperature and stable at 60° C, and unreactive with said metal acetylacetone at the thermoparticulation temperature of said metal acetylacetonate.

4,100,122

TRANS-POLYISOPRENE COMPOSITIONS

Eric George Kent, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation of Ser. No. 605,835, Aug. 19, 1975, abandoned.
This application Mar. 18, 1977, Ser. No. 778,965
Claims priority, application Canada, Sep. 10, 1974, 209009
Int. Cl.[2] C08K *3/36, 5/01, 7/14*
U.S. Cl. 260—28.5 B 7 Claims

1. A thermoplastic remoldable composition of improved dimensional stability and stiffness comprising a mixture of 100 parts by weight of trans-1,4-poly-isoprene, 5 to 50 parts by weight of short, chopped glass fibres and 5 to 40 parts by weight of finely divided reinforcing silica filler, wherein said trans-1,4-polyisoprene is a high molecular weight polymer of isoprene having a trans-1,4 content of at least 85%, a crystallinity as determined by X-ray diffraction of about 15–40%, a Mooney viscosity (ML-4 at 100° C) of about 5 to 50 and a crystalline melting point of from about 20° C to about 80° C.

4,100,123

POLYCHLOROPRENE-CONTAINING BLENDS

Peter Henry Westermann, Dorking, England, assignor to The British Petroleum Company Limited, London, England

Filed Jan. 13, 1977, Ser. No. 759,244
Claims priority, application United Kingdom, Jan. 16, 1976, 1716/76
Int. Cl.[2] C08L *95/00*
U.S. Cl. 260—28.5 B 18 Claims

1. A vulcanizable composition comprising (a) a rubber component containing a polychloroprene and a rubbery terpolymer of ethylene, propylene, and a diene or triene monomer said terpolymer containing at least 50% by weight of units derived from ethylene the weight ratio of said polychloroprene to said terpolymer of from 1:005 to 1:1.5, and (b) 3 to 300 parts by weight, per 100 parts by weight of rubbery component of a hardened extract obtained by blowing air at elevated temperature into a solvent extract of a distillate petroleum fraction boiling in the lubricating oil boiling range and containing a major proportion of aromatic hydrocarbons and having a saturated hydrocarbon content of not more than 10% by weight.

4,100,124

SILICONE BINDING COMPOSITIONS USEFUL IN PREPARING GASKETS AND PACKINGS

Kunihiro Ichikawa; Terumi Mie, both of Ichihara, and Isao Ona, Kimitsu, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 782,139
Claims priority, application Japan, May 6, 1976, 51-50796
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—29.2 M 5 Claims

1. A composition of matter which is useful in preparing gaskets and packings which consists essentially of

(A) 100 parts by weight an an α,ω-dihydroxydiorganopolysiloxane having a viscosity of at least 100 cs. at 25° C.,

(B) 5–150 parts by weight of a silane of the general formula

$$RSi(OR')_3$$

wherein R is a substituted or unsubstituted monovalent hydrocarbon radical, R' is an aliphatic hydrocarbon radical containing 1 to 4 carbon atoms,

(C) 0.1–15 parts by weight of an organometallic catalyst,

(D) 1–20 parts by weight of an emulsifying agent and
(E) 50–1000 parts by weight of water,
(F) sufficient solid gasketing material to form a gasket.

4,100,125

SEAMLESS FLOORING AND METHOD AND COMPOSITIONS FOR MAKING SAME

Michael Pezzuto, Jr., Burlington, Mass., assignor to Beatrice Foods Company, Wilmington, Mass.

Continuation of Ser. No. 358,029, May 7, 1973, abandoned, which is a continuation of Ser. No. 72,672, Sep. 16, 1970, abandoned. This application Jul. 19, 1976, Ser. No. 706,783
Int. Cl.[2] C08L *13/02, 31/02*
U.S. Cl. 260—29.6 TA **6 Claims**

1. A film-forming composition, consisting essentially of an aqueous emulsion of:

an emulsion polymer of a major proportion of monomer selected from the class consisting of methyl methacrylate and butyl methacrylate and a minor proportion of an unsaturated monocarboxylic acid monomer capable of rendering said monomer in major proportion more hydrophilic and stabilizing said aqueous emulsion, the monomers being copolymerized by emulsion polymerization to a molecular weight in the range of from the order of 4×10^5 to the order of 2×10^6 and exhibiting a glass transition temperture in the range of 35° C to 55° C, and

a plasticizing solvent for the emulsion polymer having a boiling point between about 212° F to 400° F, said polymer when applied as a film at a wet thickness of about 3 mil developing a Sward hardness in the range of 25 to 45 in 18 hours or less.

4,100,126

STABILIZATION OF NITRILE RESINS WITH HALF ACID SALTS OF MALEIC ACID

Gerald Goldberg, and Paul Richard Kaufman, both of Parkersburg, W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 8, 1977, Ser. No. 785,907
Int. Cl.[2] C08L *33/20, 55/02*
U.S. Cl. 260—29.6 AQ **3 Claims**

1. A nitrile resin composition stable toward thermal discoloration comprising:

A. a polymer selected from the group consisting of polymers of an α,β-unsaturated nitrile with at least one other vinyl monomer copolymerizable therewith; graft polymers of an α,β-unsaturated nitrile, at least one additional vinyl monomer copolymerizable therewith and a diene rubber; and blends thereof, said polymer having been coagulated from a latex emulsion by use of an inorganic salt of a Group IIA metal ion, and

B. as a stabilizer, an effective amount of a half-acid salt of maleic acid selected from the group consisting of sodium acid maleate and magnesium acid maleate.

4,100,127

PROCESS FOR PREPARATION OF GRAFTED UNSATURATED POLYESTER LIQUID RESIN DISPERSION

Hiroshi Fukusaki; Masao Niki, and Yukinaga Yokota, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

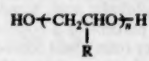
Filed Feb. 9, 1977, Ser. No. 767,150
Claims priority, application Japan, Mar. 8, 1976, 51-24870
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—29.6 NR **12 Claims**

1. A process for preparing a liquid resin dispersion, which comprises the steps of:

(1) preparing a surface active, unsaturated polyester by reacting and condensing a polyester-forming dicarboxylic acid component containing at least 30 mole % of an unsaturated dicarboxylic acid or anhydride thereof, with a mixture of polyol components consisting essentially of

(A) at least one ester-forming polyol selected from the group consisting of 4,4'-bis(β-hydroxyethoxyphenyl)-2,2-propane, 4,4'-bis(β-hydroxypropoxyphenyl)-2,2-propane, diglycidyl ether of 2,2-bis(4-hydroxyphenyl)propane, di-β-methylglycidyl ether of 2,2-bis(4-hydroxyphenyl)-propane and 2,2-bis(4-hydroxycyclohexyl)propane, and

(B) at least one member having the formula

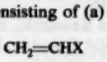


wherein R is H or CH_3 and n is from 3 to 100, wherein the amount of (B) is from 10 to 50% by weight, based on the weight of A,

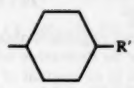
whereby to form a surface active, unsaturated polyester having a number average molecular weight of from 500 to 5000;

(2) dispersing the unsaturated polyester obtained in step (1) in the colloidal state in water to form an oil-in-water colloidal dispersion, said dispersion being free of water-soluble protective colloids and emulsifiers,

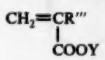
(3) adding to the dispersion obtained in step (2) from 0.1 to 50% by weight, based on the weight of said polyester, of at least one water-insoluble monomer selected from the group consisting of (a) monomers having the formula



wherein X is —OOCR″ wherein R″ is alkyl having one to 8 carbon atoms,



wherein R′ is H, CH_3 or $CH{=}CH_2$, —Cl, —CN, $-Si(OCH_3)_3$, $-Si(OC_2H_5)_3$, $-Si(OCH_2CH_2OCH_3)_3$ or $-Si(OOCCH_3)_3$, and (b) monomers having the formula



wherein R‴ is —H or $-CH_3$, and Y is alkyl having 3 to 8 carbon atoms, $-(CH_2)_2OR''''$ wherein R‴′ is alkyl having one to 4 carbon atoms, glycidyl, $-(CH_2)_3Si(OCH_3)_3$ or $-(CH_2)_3Si(OCH_2CH_2OCH_3)_3$,

so that said monomer is solubilized by said polyester, and adding a radical polymerization initiator and grafting said monomer to said polyester whereby to obtain an aqueous dispersion of said polyester having said monomer grafted thereto.

4,100,128

OIL-PLASTICIZED COPOLYMERS OF SO_2 AND OLEFINS

Guido Sartori, Linden, and Robert D. Lundberg, Somerville, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 634,881, Nov. 24, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,367
Int. Cl.[2] C08G *75/18;* **C08K** *5/01*
U.S. Cl. 260—33.6 UA **6 Claims**

1. A flexible composition consisting of:

(a) 100 parts by weight of an olefin-SO_2 copolymer, said olefin-SO_2 copolymer having a softening point of at least about 40° C., said olefin-SO_2 copolymer being formed from at least one alpha olefin having at least 20 carbon

atoms, said copolymer having about 5 to about 9.5 wt. % of sulfur; and

(b) about 5 to about 24 parts per hundred by weight based on 100 parts of said copolymer of a nonpolar oil having a number average molecular weight of about 200 to about 540, a solubility parameter of about 7.0 to about 8.5, and at least about 10 wt. % of naphthenic hydrocarbons.

4,100,129

CURABLE COMPOSITIONS AND PROCESS

Melvin D. Beers, Elnora, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 417,787, Nov. 21, 1973, abandoned. This application May 19, 1975, Ser. No. 579,025

Int. Cl.[2] C08G 77/04; C08L 43/04

U.S. Cl. 260—37 SB 38 Claims

1. A fluid composition stable under substantially anhydrous conditions and curable to a self-bonding elastic solid in the presence of moisture which comprises:

(a) 100 parts by weight of a silanol chain-stopped polydiorganosiloxane of the formula:

wherein R and R^1 are each, independently, organic radicals of up to 8 carbon atoms selected from hydrocarbyl, halohydrocarbyl and cyano lower alkyl and n is an average number of from about 10 to 15,000;

(b) from 0.01 to 5.0 parts by weight of a cross-linking silane of the formula:

$$R_m^2 Si(OR^3)_{4-m}$$

wherein R^2 and R^3 have the values defined for R and R^1 hereinabove and m has a value of 0 to 3 and an average value based on the total amount of silane in the composition of 0 to 1.99; and

(c) from 0.1 to 10 parts by weight of a silanol reactive organometallic ester compound of a metal other than silicon, said compound being a partially chelated ester of a lower aliphatic alcohol with a β-dicarbonyl compound or a partial hydrolyzate of such compounds which retain at least one hydrocarbonoxy radical or substituted by hydrocarbonoxy radical attached to the metal atom through M—O—C linkages wherein M is the metal, the weight ratio of components (c) to (b) always being at least 0.5 to 1.

4,100,130

FLAME-RESISTANT POLYCARBONATES

Dieter Freitag, Krefeld-Taar, and Werner Nouvertné, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 2, 1975, Ser. No. 592,588

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1974, 2435508

Int. Cl.[2] C08K 3/06

U.S. Cl. 260—37 PC 17 Claims

1. Molding compositions consisting essentially of aromatic polycarbonates having molecular weights M_w of about 20,000 to 80,000 and about 0.5 to 7% by weight of sulphur, relative to the total weight of polycarbonate and sulphur.

4,100,131

SPIN DYEING OF ACRYLIC FIBRES

Francis René Daniel Manier, Cinqueux, and Pierre Léon Adolphe Caulett, Taverny, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 27, 1975, Ser. No. 544,539

Claims priority, application France, Feb. 8, 1974, 74 04248

Int. Cl.[2] C08K 5/00

U.S. Cl. 260—42.21 10 Claims

1. Process for the spin dyeing of acrylic fibre obtained by spinning a collodion containing 15% to 25% of a homopolymer or copolymer of acrylonitrile, wherein the collodion is dyed by means of at least one nitrate of a cationic dyestuff in which the dyestuff cation is a derivative of a triphenylmethane, contains a cycloammonium group or comprises a side chain carrying a quaternary nitrogen atom, the colouring agent being added to the collodion in the form of a stock solution containing 1% to 30% of dyestuff nitrate.

4,100,132

STABILIZED POLYOLEFIN COMPOSITION

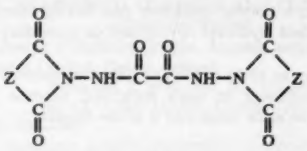
Harry Elwyn Hill, Wallingford, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed Mar. 22, 1976, Ser. No. 668,842

Int. Cl.[2] C08K 5/26

U.S. Cl. 260—42.46 21 Claims

1. A compound having the structural formula:



(I)

wherein Z is a bivalent radical which together with the dicarboximide group forms a monocyclic or polycyclic ring system and is selected from the group consisting of phenylene, cyclohexylene, cyclohexenylene, cyclohexenylene substituted by a methyl group, norbornenylene, ethylene, vinylene and tetradecenylene.

4,100,133

AIR-DRY CURABLE COMPOSITIONS COMPRISING DICYCLOPENTENYL (METH) ACRYLATE COPOLYMERS AND NON-VOLATILE REACTIVE MONOMER, AND CURED COATINGS AND IMPREGNATIONS OBTAINED THEREFROM

William D. Emmons, Huntingdon Valley; Peter R. Sperry, Doylestown, and Kayson Nyi, Sellersville, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 699,726, Jun. 24, 1976. This application May 31, 1977, Ser. No. 802,087

Int. Cl.[2] C08K 5/33; C08L 31/02

U.S. Cl. 260—45.9 L 12 Claims

1. An autoxidizable coating or impregnating composition comprising:

(a) a copolymer of about 5% to about 50% by weight of at least one of dicyclopentenyl acrylate or dicyclopentenyl methacrylate and about 95% to about 50% by weight respectively of at least one other monoethylenically unsaturated monomer,

(b) a non-volatile reactive monomer, at least 50 weight percent of which is at least one of dicyclopentenyl acrylate or dicyclopentenyl methacrylate,

(c) an effective amount of a polyvalent metal-containing complex or salt that catalyzes the oxidative curing of a) and b), and

(d) a small but effective amount of a volatile oxime stabilizer.

4,100,134

STORAGE-STABLE EPOXY-TERMINATED SILANE PREPOLYMER

Janis Robins, St. Paul, and J. Lamar Zollinger, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1977, Ser. No. 782,079
Int. Cl.[2] C08G 77/04
U.S. Cl. 528—10 22 Claims

1. A prepolymer composition comprising an epoxy prepolymer of an epoxy-terminated silane, said composition characterized by (1) a viscosity of less than 15,000 cp at 25° C, (2) having less than 40% by weight of low molecular weight epoxy or silane reactive materials of less than 50 A, and 3) being storage stable in solution with methylene chloride in an anhydrous environment for at least 30 days at 25°–30° C at no more than 33% solids content.

4,100,135

NOVEL ELASTOMERS AND IMPROVED WATERLESS LITHOGRAPHIC PRINTING MASTERS

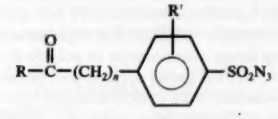
Joseph Y. C. Chu, Fairport, and Richard L. Schank, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1977, Ser. No. 791,353
Int. Cl.[2] C08G 77/04
U.S. Cl. 528—11 6 Claims

1. A process for preparing a silicone polymer comprising

(a) providing a silicone elastomer gum having from 0.1 to 10% pendant hydroxyl or primary or secondary amino groups,

(b) providing an azide stable at ambient temperature in an amount sufficient to react with said pendant groups wherein the azide employed is of the formula



wherein R is chloro or hydroxyl, R′ is chloro, cyano, hydrogen or nitro or an alkyl of from 1-8 carbon atoms and *n* is an integer of from 0-20 and

(c) reacting said azide with said silicone.

4,100,136

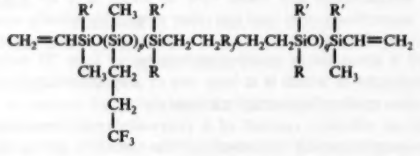
FLUOROCARBON SILOXANE COMPOSITIONS

Philip L. Carter; Yung K. Kim, and Michael O. Riley, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

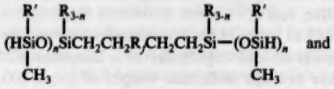
Division of Ser. No. 647,473, Jan. 8, 1976, Pat. No. 4,057,566.
This application Jun. 3, 1977, Ser. No. 803,110
Int. Cl.[2] C08G 77/04
U.S. Cl. 528—11 14 Claims

1. A curable composition consisting essentially of a homogeneous mixture of

(A) a siloxane polymer or copolymer of the formula



(B) a curing agent of the formula



(C) an effective amount of a platinum-containing catalyst; where, in (A) and (B), each R and R′ is independently methyl, phenyl, or 3,3,3-trifluoropropyl, each R_f is independently a perfluoroalkylene radical of 2 to 10 carbon atoms, a perfluorocycloalkylene radical, or a perfluoroalkylene radical of 2 to 10 carbon atoms or a perfluorocycloalkylene radical containing one or more —C—O—C— linkages; *p* has a value of 0 to 2*q* inclusive, so that, when $p = 0$, siloxane (A) is a siloxane polymer, but when *p* has a value of from greater than 0 to *q*, inclusive, siloxane (A) can be either a random copolymer or an alternating copolymer and when *p* has a value of from greater than *q* to 2*q*, inclusive, siloxane (A) is only an alternating copolymer having no more than 2 adjacent $CH_3(CF_3CH_2CH_2)SiO$ units, *q* has an average value of at least 5, each *n* is independently 1, 2, or 3, there being an average of greater than 2.0 silicon-bonded hydrogen atoms per molecule of (B) and the amount of (B) being such that there is, in said curable composition, from 0.5 to 3.0 silicon-bonded hydrogen atoms for every silicon-bonded vinyl radical.

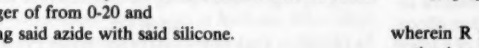
4,100,137

CROSSLINKING OF HYDROXYL-CONTAINING POLYMERS WITH POLYALDEHYDE COMPOUNDS

Raymond Urgel Lemieux, and Rastko Vukov, both of Edmonton, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Apr. 15, 1975, Ser. No. 568,381
Claims priority, application Canada, May 30, 1974, 201213
Int. Cl.[2] C08G 4/00
U.S. Cl. 526—21 18 Claims

1. A process for crosslinking polymers containing an average of at least 1.8 hydroxy groups per polymer molecule which comprises mixing a polymer having a molecular weight of about 1,000 to about 500,000 with a polyaldehyde compound of general form



wherein R is an organic group comprising one or more aromatic rings or an aliphatic group having not less than three carbon atoms one of which is quaternary, X and Y are the same and are selected from oxygen and di(methoxy), *n* is 1 or 2 and a is 0 or 1, said mixing being at a temperature of from about room temperature to about 200° C, wherein the amount of said polyaldehyde compound is at least about 0.05 molar equivalent but not more than about 2 molar equivalent to the hydroxy group content of the polymer, shaping the mixture at a temperature of about 100° C to about 200° C and cooling the shaped mixture to yield the crosslinked polymer.

4,100,138

ETHNYL TERMINATED POLYIMIDE COMPOSITES

Norman Bilow, Encino, and Boyce G. Kimmel, Palos Verdes, Peninsula, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 12, 1975, Ser. No. 576,909
Int. Cl.[2] C08G 73/12
U.S. Cl. 526—262 8 Claims

1. Laminating materials comprising copolymers or terpolymers consisting of an ethynyl-substituted polyimide oligomer coreacted with di- or polyethynyl-substituted diluent or mixtures of such diluents and a reinforcing fabric, filler or chopped fiber.

4,100,139
POLYCARBONATES INCORPORATING EPIHALOHYDRIN RESIDUES

Joseph McClendon Baggett, Freeport, and Ruben Louis Krause, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 374,858, Jun. 29, 1973, abandoned. This application Dec. 8, 1975, Ser. No. 638,393

Int. Cl.[2] C08G *63/62*

U.S. Cl. 528—196 **7 Claims**

1. A linear thermoplastic polycarbonate which comprises a reaction product under polycarbonate forming conditions of

(1) a carbonate precursor,

(2) a dihydric phenol,

(3) about 50 to about 2 mole percent of hydroxyl compounds having the formula $HO—Z—O—CH_2CH(OH)—CH_2—O—Z—_n OH$, and

(4) a catalytic quantity of a catalyst selected from the group consisting of quaternary amines and tertiary amines

wherein Z is the divalent residue from a dihydric phenol and *n* is a number having an average value from 1–5 wherein the polycarbonate has a weight average molecular weight greater than about 25,000 as determined by gel permeation chromatography.

4,100,140
PROCESS FOR THE MANUFACTURE OF CROSSLINKED POLYMERS WHICH CONTAIN IMIDE GROUPS

Sheik Abdul-Cader Zahir, Oberwill, and Alfred Renner, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 18, 1976, Ser. No. 697,791

Claims priority, application Switzerland, Jun. 19, 1975, 7988/75

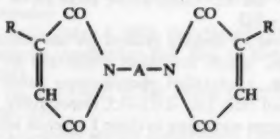
Int. Cl.[2] C08G *73/12*

U.S. Cl. 526—90 **34 Claims**

1. A process for the manufacture of a crosslinked polymer containing imide groups comprising

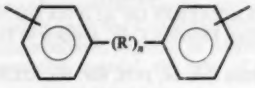
reacting at a temperature of 20° to 250° C

(a) a polyimide of the formula



wherein

R is hydrogen or methyl, and A is a divalent radical of the formula



in which R^1 is selected from the group consisting of $—CH_2—$;

$—SO_2—$, —SO—, —S— and —O—, and *n* is 0 or 1; or

a polyimide selected from the group consisting of the N,N'-bis-maleimide of 4,4'-diamino-triphenyl phosphate, the N,N'-bis-maleimide of 4,4'-diamino-triphenyl phosphate, the N,N',N''-tris-maleimide of tris-(4-aminophenyl) phosphate and the N,N',N''-tris-maleimide of tris-(4-aminophenyl) thiophosphate; or a mixture of said polyimides; with

(b) an alkenylphenol selected from the group consisting of o,o'-diallyl-bisphenol A, 4,4'-dihydroxy-3,3'-diallyldiphenyl, bis-(4-hydroxy-3-allylphenyl)methane, 2,2-bis-(4-hydroxy-3,5-diallylphenyl)propane, eugenol, o,o'-dimethallyl-bisphenol A, 4,4'-dihydroxy-3,3'-dimethylallyldiphenyl, bis-(4-hydroxy-3-methallylphenyl)methane, 2,2-bis-(4-hydroxy-3,5-dimethallylphenyl)-propane and 4-methallyl-2-methoxyphenol; or

an alkenylphenol ether selected from the group consisting of 2,2-bis(4-methoxy-3-allylphenyl)propane, 2,2-bis(4-methoxy-3-methallylphenyl)propane, 4,4'-dimethoxy-3,3'-diallyldiphenyl, 4,4'-dimethoxy-3,3'-dimethallyldiphenyl, bis(4-methoxy-3-allylphenyl)methane, bis(4-methoxy-3-methallylphenyl)methane, 2,2-bis(4-methoxy-3,5-diallylphenyl)propane, 2,2-bis-(4-methoxy-3,5-dimethallylphenyl)propane, 4-allylveratrole and 4-methallyl-veratrole; or

a mixture of said alkenylphenols, a mixture of said alkenylphenol ethers or a mixture of said alkenylphenols and said alkenylphenol ethers;

in such molar proportion that for each 1 equivalent of polyimide component (a) there is from 0.1 to 10 moles of alkenylphenol, alkenylphenol ether or mixture thereof as component (b).

4,100,141
STABILIZED ADHESIVE AND CURING COMPOSITIONS

Denis Joseph O'Sullivan, Dublin, Ireland, assignor to Loctite (Ireland) Limited, Dublin, Ireland

Filed Jul. 2, 1976, Ser. No. 702,309

Int. Cl.[2] C08F *112/08, 114/06, 120/14*

U.S. Cl. 526—301 **17 Claims**

1. A stabilized, curable composition comprising:

a. a free radical-polymerizable monomer selected from the group consisting of aromatic and alkyl vinyl compounds, halogen-substituted vinyl compounds, alkyl and aromatic acrylates and methacrylates, and urethane-acrylates and -methacrylates;

b. an effective amount for initiation of a peroxy or photosensitive initiator; and

c. an effective amount for stabilization of the composition of an inhibitor system selected from the group consisting of an allyl alkoxyl hydroquinone and the combination of a compound containing the allyl group $CH_2=CH—CH_2—$, but no inorganic group of the reducing type, with an alkoxyl hydroquinone, said alkoxyl hydroquinone group containing 1 to about 4 carbon atoms and said inhibitor system being dissolved in the monomer.

4,100,142
POLYESTER PROCESS AND PRODUCT

Peter Schaefer, Charlotte; Peter Alan Mason, Salisbury, and William Harold Yates, Charlotte, all of N.C., assignors to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 288,837, Sep. 13, 1972, abandoned. This application Oct. 20, 1976, Ser. No. 734,214

Int. Cl.[2] C08G *63/70, 63/12*

U.S. Cl. 526—68 **11 Claims**

1. In a process for developing high molecular weight polyester from a direct esterification polyester prepolymer having an intrinsic viscosity of at least about 0.1 wherein said prepolymer is passed through a polymer finisher of the type comprising a generally cylindrical vessel having an inlet for liquid near one end and an outlet for liquid near the opposite end thereof and an intermediate vent for vapor and, mounted inside along an axis substantially parallel to the cylindrical axis, a multiplicity of foraminous surface generating members adapted to rotate and thereby agitate liquid in the vessel, the cross-sectional void space and spacing in between said members generally increas-

ing from the inlet end in the direction of the outlet end, the improvement which comprises positioning said members so that substantially all of said members exert a baffling factor (B) of above about 3500 on liquid flowing therethrough where $B = (PNv)/A$ wherein B is the baffling factor, N is number of surface area generators from the point of calculation in the high polymerizer to the discharge end of the reactor, Pv is polymer viscosity in poises at the point of calculation in the high polymerizer and A is the average cross-sectional void area of the surface generator at the point of calculation beneath the polymer pool level expressed in square feet at standstill.

4,100,143

FILAMENTS WHICH MAY BE CROSS-LINKED COMPRISING AT LEAST 65% ACRYLONITRILE AND 0.5–10% N-METHYLOL DERIVATIVE OF A URETHANE

Gerhard Dieter Wolf; Werner Schnoor, both of Dormagen; Jean-Claude Voegele, Dormagen-Hackenbroich; Ulrich Reinehr, and Günther Nischk, both of Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany.

Filed Jan. 19, 1977, Ser. No. 760,704

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602352

Int. Cl.[2] B01F *9/08;* **C08F** *28/00, 18/24, 20/70*

U.S. Cl. 526—301 **4 Claims**

1. A filament or fiber of an addition copolymer comprising at least 65% by weight of acrylonitrile; 0.5–10% by weight of at least one N-methylol compound of an unsaturated monourethane, bisurethane, alkyl ether of a monourethane, or ethyl ether of a bisurethane; and 0–30% by weight of at least one comonomer selected from the group consisting of acrylic acid alkyl esters, methacrylic acid alkyl esters, unsaturated sulfonic acids, unsaturated amides, unsaturated urethanes, unsaturated ureas, unsaturated hydrazides, unsaturated semicarbazides, and halogen containing monomers copolymerizable with acrylonitrile, the amount of said halogen containing monomer being 10–30% and the amount of all others of said comonomers being 0–10%.

4,100,144

PROCESS FOR THE PREPARATION OF OLIGOURETHANES

Willi Dünwald, Leverkusen; Jürgen Lewalter, Odenthal; Rudolf Merten, Leverkusen, and Hans-Jürgen Müller, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 6, 1977, Ser. No. 803,718

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1976, 2626175

Int. Cl.[2] C08G *18/08*

U.S. Cl. 260—860 **10 Claims**

1. A process for the preparation of oligourethanes having isocyanate end groups blocked with alkanol and/or cycloalkanol groups by the reaction of aromatic polyisocyanates with monohydric and polyhydric alcohols having aliphatically and/or cycloaliphatically bound hydroxyl groups, characterized in that aromatic polyisocyanates are reacted with about 0.7 to 1.5 times the equivalent quantity, in terms of the NCO-/OH reaction, of monohydric and polyhydric alcohols having aliphatically and/or cycloaliphatically bound hydroxyl groups, the proportion of monohydric to polyhydric alcohols being calculated so that from about 30 to 70% of the total quantity of alcoholic hydroxyl groups present consist of hydroxyl groups of one or more monohydric alcohols and about 70 to 30% of the total quantity of hydroxyl groups present consist of hydroxyl groups of one or more polyhydric alcohols, the reaction being carried out either by introducing the total quantity of alcohol component as a mixture into the reaction vessel and then adding the polyisocyanate to this mixture or by introducing at least about 70 equivalent percent, in terms of the NCO/OH reaction, of the alcohol component into the reaction vessel and reacting it with the total quantity of polyisocyanate and thereupon adding the remaining quantity of alcohol to the prepolymer initially obtained which contains free isocyanate groups, at least about 50 equivalents percent of the total quantity of polyhydric alcohol components being already in the alcohol mixture originally introduced into the reaction vessel if the second reaction method mentioned is employed.

4,100,145

POLYMERIZATION OF 2-PYRROLIDONE WITH CATALYST PREPARED FROM THE REACTION PRODUCT OF CO_2 AND ANHYDROUS POTASSIUM PYRROLIDONATE

Ralph House, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 28, 1975, Ser. No. 636,200

Int. Cl.[2] C08G *69/24*

U.S. Cl. 528—312 **3 Claims**

1. A process for polymerizing 2-pyrrolidone to produce polypyrrolidone capable of being formed into fibers which comprises contacting 2-pyrrolidone in a reaction vessel with a catalyst prepared by steps comprising reacting CO_2 with a potassium pyrrolidonate to obtain a CO_2 adduct thereof, wherein the potassium pyrrolidonate is prepared outside of the reaction vessel by steps comprising contacting and reacting potassium hydroxide with 2-pyrrolidone in equal molar amounts, in a reaction zone and in the absence of any appreciable excess of 2-pyrrolidone or potassium hydroxide above the equal molar amounts in the reaction zone, to produce an aqueous mixture and drying said mixture to obtain the potassium pyrrolidonate in substantially anhydrous form.

4,100,146

PHOSPHONIUM CATALYST SYSTEM FOR THE POLYMERIZATION OF 2-PYRROLIDONE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 20, 1976, Ser. No. 724,802

Int. Cl.[2] C08G *69/24;* **B01J** *23/04*

U.S. Cl. 528—313 **10 Claims**

1. A process for making catalyst for the polymerization of 2-pyrrolidone, which comprises contacting an alkali metal pyrrolidonate, a tetraalkyl phosphonium halide and carbon dioxide in mol ratio 1:0.1-2:0.1–0.5, respectively.

7. The process according to claim 1 wherein said alkali metal pyrrolidonate is prepared by contacting an alkali metal hydroxide with 2-pyrrolidine.

4,100,147

POLYMERIZATION OF ALIPHATIC NITRILES

Gordon H. Miller, Littleton, Colo., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,702

Int. Cl.[2] C08G *63/00*

U.S. Cl. 528—362 **16 Claims**

1. A process for preparing a soluble, curable triazine polymer which comprises:

(A) preparing a partially cured, thermoplastic triazine polymer by heating an aliphatic polynitrile of the formula:

wherein n is an integer of from 1 to 8 inclusive and in each

unit

R and R′ are independently selected from the group consisting of hydrogen, alkyl of from 1 to 10 inclusive carbon atoms, amino, nitro, hydroxyl, carboxyl and halogen, at a temperature of about 80° to about 450° C in the presence of a catalyst selected from the group consisting of:

(a) phosphorous pentoxide, phosphorous trichloride, phosphorous pentachloride, arsenic trichloride, or arsenic pentachloride;

(b) hydrochloric acid, hydrofluoric acid, fluosulfonic acid, chlorosulfonic acid; or

(c) halides of metals of Groups, II, III, IV, V or VIII of the Periodic Table as set forth on page 125 of Mellor's Inorganic Chemistry, Revised Edition 1967,

(B) contacting the said partially cured, thermoplastic triazine polymer with a solvent of the formula:

$$R-O-R',$$

where R and R′ are independently selected alkyl groups from 1 to 5 carbon atoms in order to extract therefrom the unreacted polynitrile;

(C) extracting the soluble, curable triazine polymer as an alcoholic solution by contacting the thus-treated partially cured thermoplastic triazine polymer with a monohydric alcohol, and

(D) recovering the soluble, curable triazine polymer from said alcohol solution and wherein from about 0.1 to about 5.0 weight percent of said catalyst is employed based on the weight of the polynitrile.

4,100,148

STORAGE-STABLE, VERY QUICKLY HARDENABLE, ONE-COMPONENT SEALANT BASED ON MERCAPTO-TERMINATED POLYMERS

Lothar Hockenberger, Ludwigshafen am Rhein; Manfred Soyka, Duisburg, and Gerhard Wilhelm, Viernheim, all of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 4, 1976, Ser. No. 683,136

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1975, 2526603

Int. Cl.² C08G *75/00, 75/04;* **C09J** *3/14*

U.S. Cl. 528—374 **9 Claims**

1. A storage-stable sealant composition capable of quickly hardening, said composition comprising at least one liquid monomer, oligomer or polymer having terminal mercapto groups; and at least one oxidation agent for curing said liquid monomer, oligomer or polymer; wherein said oxidation agent is substantially uniformly distributed throughout said composition in the form of encapsulated small particles of a paste made from said oxidation agent and a plasticizer which is compatible with said liquid monomer, oligomer or polymer wrapped in a gelatin encapsulating material, the ratio of paste to gelatin being 12:1.

4,100,149

METHOD OF SEPARATING PROTEINS BY ION EXCHANGE

Frančois Meiller, Palaiseau, and Bernard Mirabel, Fresnes, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Aug. 16, 1976, Ser. No. 714,308

Claims priority, application France, Aug. 28, 1975, 75 26530; Jul. 28, 1976, 76 22985

Int. Cl.² A23J *1/20, 1/16, 1/08, 1/06*

U.S. Cl. 260—112 R **10 Claims**

1. A method of separating proteins from solution, comprising putting a solution of proteins into contact with an ion exchange resin, comprising a porous inorganic carrier with a particle size from 4 μm to 5 mm, a specific surface area of approximately 5 to 150 m^2/g, a pore diameter of 500 to 2500 A and a pore volume of 0.4 to 2 ml/g, coated with less than 15 mg/m^2 of a film of cross-linked polymer, containing or carrying either tertiary amines or quaternary ammonium salts, as anion exchanging groups, or acid functions as cationic exchanging groups, wherein at least one protein becoming fixed onto the ion exchange resin, and eluting the fixed protein(s) from the ion exchange resin.

4,100,150

STABILIZATION OF INTERFERON AGAINST MECHANICAL STRESS USING THIOCTIC ACID

Terence Cartwright, Merton, England, assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 628,747, Nov. 4, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 749,130

Int. Cl.² A61K *45/02*

U.S. Cl. 260—112 R **4 Claims**

1. A method for stabilizing interferon against mechanical stress conprising treating an interferon preparation with an effective stabilizing amount of thioctic acid for selectively retaining interferon sulfhydryl groups in the reduced state without reduction of essential disulfide linkages.

4,100,151

ENZYMATIC MODIFICATION OF CORN GLUTEN

Jens Lorenz Adler-Nissen, Copenhagen, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Filed Jan. 6, 1977, Ser. No. 757,330

Claims priority, application United Kingdom, Jan. 12, 1976, 1090/76

Int. Cl.² A23J *1/16, 1/12*

U.S. Cl. 260—112 G **8 Claims**

8. Corn gluten modified by proteolytic treatment in an aqueous suspension contaning above about 6% w/w of protein with from 0.5 – 0.5 Anson units/l of proteinase until the viscosity exceeds about 50 cP.

4,100,152

PEPTIDES

Masahiko Fujino, Takarazuka; Osamu Nishimura, Toyonaka; Yuji Nagawa, Nagaokakyo, and Naohisa Fukuda, Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

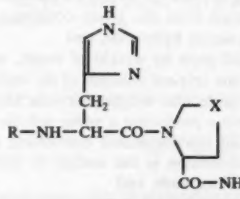
Filed Mar. 16, 1977, Ser. No. 778,321

Claims priority, application Japan, Mar. 23, 1976, 51-32170

Int. Cl.² C07C *103/52;* **A61K** *37/00*

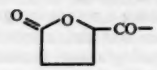
U.S. Cl. 260—112.5 TR **3 Claims**

1. A member selected from the group consisting of a compound of the formula



wherein A represents hydrogen, alkyl of up to 10 carbon atoms, aralkyl of up to 10 carbon atoms, alkoxyalkyl of up to 9 carbon atoms, hydroxyalkyl of up to 9 carbon atoms or alkoxy of up to 9 carbon atoms,

R represents



X represents —S— or —$(CH_2)_n$— wherein *n* is 1 or 2, and a pharmacologically acceptable acid salt thereof.

4,100,153

(D-TRP^5)-SOMATOSTATIN AND ANALOGUES THEREOF

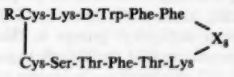
Victor M. Garsky, Radnor, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed May 11, 1977, Ser. No. 795,687

Int. Cl.^{2} C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 S **4 Claims**

1. A polypeptide of the formula:



wherein:

R is hydrogen, lower alkanoyl, Ala-Gly-, Gly-Gly-Gly-, Ala-D-Ala- or p-Glu;

and

X_8 is L-Trp or D-Trp;

or the linear reduced form thereof; or a non-toxic acid addition salt thereof.

4,100,154

PROCESS FOR RECOVERY AND SEPARATION OF NUTRITIOUS PROTEIN HYDROLYSATE AND CHROMIUM FROM CHROME LEATHER SCRAP

Donald Francis Holloway, Milwaukee, Wis., assignor to A. L. Gebhardt Company, Milwaukee, Wis.

Filed Apr. 22, 1977, Ser. No. 789,857

Int. Cl.^{2} A23J *1/10;* C07G *7/00*

U.S. Cl. 260—123.7 **8 Claims**

1. A process for making protein hydrolysate from chrome leather scrap which comprises the steps:

(a) heating to a temperature above 200° F a mixture comprised of:

(i) 100 parts by weight of chrome leather scrap,

(ii) at least eight parts by weight of alkaline earth compound selected from the group consisting of calcium oxide and calcium hydroxide, and

(iii) at least 100 parts by weight of water, until substantially all of the original collagen of the leather has been reduced to molecular weights between about 1500 and 10,000, thereby producing a water soluble protein hydrolysate and simultaneously converting substantially all of the chromium in the leather to water insoluble chromium compounds; and

(b) separating the water soluble protein hydrolysate from the insoluble chromium compounds to provide:

(i) a protein hydrolysate that is substantially free of chromium, and

(ii) a residue of chromium compounds that is substantially free from protein.

4,100,155

METHOD OF CONDENSING AND/OR POLYMERIZING SULFONATED LIGNIN CONTAINING MATERIALS

Theodore Heinrich Gustave Ashorn, and Paul Elis Laine, both of Tampere, Finland, assignors to G. A. Serlachius Oy, Mantta, Finland

Filed Jan. 5, 1977, Ser. No. 757,070

Claims priority, application Finland, Jan. 30, 1976, 752488

Int. Cl.^{2} C07G *1/00*

U.S. Cl. 260—124 R **5 Claims**

1. Method for converting sulfonated lignin containing materials to substantially water soluble products comprising

(a) adjusting the pH of the material such that a 3 percent aqueous solution of the material has a pH below 7;

(b) adjusting the moisture content of the pH adjusted material to a value from 1 to 15 percent; and

(c) subjecting the material from step (b) to heating at a temperature range from 80° to 225° C in a manner to maintain the moisture content of the material at a value sufficient to allow the conversion to proceed, but less than 15 percent, and for a time period sufficient to form products having viscosity at least 25 percent higher than the viscosity of the starting material, said viscosities being measured in a 50 percent aqueous solution at room temperature.

4,100,156

CHLORINE-CONTAINING DISAZA PIGMENTS

Paul Müller, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

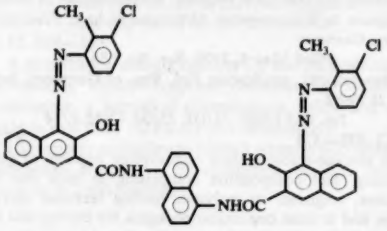
Filed Dec. 9, 1974, Ser. No. 531,028

Claims priority, application Switzerland, Dec. 20, 1973, 17900/73

Int. Cl.^{2} C09B *31/12, 33/04, 35/06, 43/00*

U.S. Cl. 260—174 **1 Claim**

1. The disazo pigment of the formula



4,100,157

β-CRYSTALLINE FORM OF THE PIGMENT OBTAINED BY COUPLING DIAZOTIZED 1-AMINOBENZENE-2-CARBOXYLIC ACID METHYL ESTER WITH 2,3-OXYNAPHTHOIC ACID

Paul Müller, Basel, and Willy Müller, Rhine, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

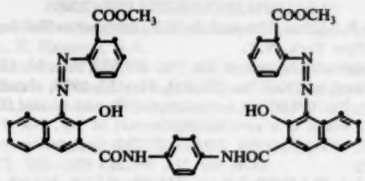
Continuation of Ser. No. 391,102, Aug. 27, 1973, abandoned. This application Jul. 16, 1975, Ser. No. 596,490

Claims priority, application Switzerland, Sep. 5, 1972, 13034/72

Int. Cl.^{2} C09B *43/00, 43/12*

U.S. Cl. 260—174 **5 Claims**

1. A disazo pigment of the formula



in the β-modification thereof, whose X-ray diffraction pattern at an interplanar spacing of 3.33 A° shows a line of very strong intensity, at 5.38 and 8.33 A° lines of strong intensity, at 3.74, 4.24, 4.68, 4.94, 5.18 and 8.70 A° lines of medium intensity, at 4.05, 4.37, 6.33 and 12.6 A° lines of medium to faint intensity, at 3.50, 3.94, 5.65, 6.09, 6.71, 10.6 and 11.5 A° lines of faint intensity.

4,100,158

OSMIUM COMPOUNDS

Paul Cedric Hydes, and Michael James Cleare, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Jul. 2, 1976, Ser. No. 702,132

Claims priority, application United Kingdom, Jul. 9, 1975, 28877/75

Int. Cl.[2] C07F *15/00*

U.S. Cl. 544—225 **1 Claim**

1. A complex consisting of osmium tetroxide and a compound selected from the group consisting of pyridazine, phthalazine, isoquinoline, triethylenediamine, and quinuclidine.

4,100,159

PROCESS FOR PREPARATION OF 9-(2,6-DIHALOBENZYL)ADENINES

Michael C. Vander Zwan, Maple Glen, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 7, 1977, Ser. No. 766,326

Int. Cl.[2] C07D *473/34*

U.S. Cl. 544—277 **4 Claims**

1. An improved process for alkylating an alkali or alkaline earth metal salt of adenine with 2,6-dihalobenzyl halide and producing a mixture of isomers of (2,6-dihalobenzyl)adenine in which at least about 70% by weight is 9-(2,6-dihalobenzyl)adenine wherein the improvement comprises carrying out the alkylation in a rapidly stirred solid-liquid or liquid-liquid two phase system wherein,

(a) the solid-liquid two phase system comprises a solid phase comprising an alkali or alkaline earth metal salt of adenine and a liquid phase comprising a solution of 2,6-dihalobenzyl halide and an onium salt phase transfer catalyst having the structure:

$(R)_3N^{\oplus}R_1\ Z^{\ominus}$ or

$(R_1)_3P^{\oplus}R\ Z^{\ominus}$

wherein R is alkyl having 4 to 18 carbon atoms, R_1 is alkyl having 1 to 8 carbon atoms and $Z^{\ominus}$ is an anion selected from the group consisting of chlorine, bromine and iodine in an aprotic water miscible or water immiscible organic solvent wherein the water miscible solvent contains from 0 to about 5 moles of water per mole of adenine salt,

(b) the liquid-liquid two phase system comprises one liquid phase comprising an aqueous solution of an alkali or alkaline earth metal salt of adenine and a second liquid phase comprising a solution of 2,6-dihalobenzyl halide and an onium salt phase transfer catalyst having the structure:

$(R)_3N^{\oplus}R_1\ Z^{\ominus}$ or

$(R_1)_3P^{\oplus}R\ Z^{\ominus}$

wherein R, R_1 and $Z^{\ominus}$ are as defined above in an aprotic water immiscible organic solvent; wherein the phase transfer catalyst is used in an amount from about 1 mole % to about 10 mole % relative to adenine and the alkylation is carried out at a temperature range of room temperature to 150° C. from about 1 hour to about 24 hours.

4,100,160

THERAPEUTIC COMPOSITIONS COMPRISING ALPHA-HYDROXY ANALOGS OF ESSENTIAL AMINO ACIDS AND THEIR ADMINISTRATION TO HUMANS FOR PROMOTION OF PROTEIN SYNTHESIS AND SUPPRESSION OF UREA FORMATION

Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 461,259, Apr. 15, 1974, abandoned, and Ser. No. 461,260, Apr. 15, 1974, abandoned, each is a continuation-in-part of Ser. No. 355,326, Apr. 30, 1973, abandoned, and Ser. No. 355,327, Apr. 30, 1973, abandoned, said Ser. No. 355,327, is a continuation-in-part of Ser. No. 270,986, Jul. 12, 1972, abandoned. This application Mar. 23, 1976, Ser. No. 669,588

Int. Cl.[2] A61K *31/19, 31/40, 31/195*

U.S. Cl. 424—274 **30 Claims**

1. A composition capable of promoting protein synthesis and conserving nitrogen in a patient in need thereof, said composition being in the form of a mixture adapted for oral or parenteral administration to subjects on a protein-restricted diet, said composition being substantially devoid of non-essential amino acids, and said composition comprising a mixture of effective quantities of hydroxy-acid and/or keto-acid analogs of the essential amino acids valine, phenylalanine, isoleucine, leucine and methionine, at least one of said analogs of essential amino acids being hydroxy-acid analogs, said hydroxy-acid or keto-acid analogs being present in the form of the acid analogs per se or salts of the acid analogs.

4,100,161

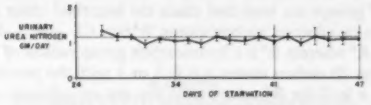
PROMOTION OF PROTEIN SYNTHESIS AND SUPPRESSION OF UREA FORMATION IN THE BODY BY KETO ANALOGS OF ESSENTIAL AMINO ACIDS

Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 461,222, Apr. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 355,327, Apr. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 270,986, Jul. 12, 1972, abandoned. This application Mar. 23, 1976, Ser. No. 669,590

Int. Cl.[2] A61K *31/40, 31/19, 31/195*

U.S. Cl. 424—274 **18 Claims**



1. A composition capable of promoting protein synthesis and conserving nitrogen in a patient in need thereof, said composition being in the form of a mixture adapted for oral or parenteral administration to subjects on a protein-restricted diet, said composition consisting essentially of effective quantities of the keto-acid analogs of the branched-chain essential amino acids valine, leucine and isoleucine.

4,100,162

PROCESS FOR PREPARING GAMMA QUINACRIDONE FROM POLYPHOSPHORIC ACID AND ALCOHOL

Robert Jarl North, Elmwood Park, N.J., assignor to Harmon Colors, New York, N.Y.

Continuation-in-part of Ser. No. 643,445, Dec. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 518,557, Oct. 29, 1974, abandoned. This application Jan. 17, 1977, Ser. No. 759,692

Int. Cl.[2] C09B *48/00*

U.S. Cl. 260—279 QA **5 Claims**

1. A process for the direct production of gamma quinacridone pigment which comprises heating, at a temperature between 80° and 120° C. 2,5-dianilinoterephthalic acid in polyphosphoric acid, diluting the reaction mixture by addition thereof to a water-miscible alcohol containing 1 to 3 carbon atoms in an amount sufficient to dissolve the polyphosphoric acid while maintaining the temperature of the alcohol between about 0° and 25° C. during said addition, and thereafter separating gamma quinacridone from the resulting mixture.

4,100,163

SUBSTITUTED 8-SULFONAMIDOQUINOLINES

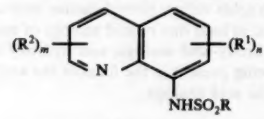
Michael J. Virnig, Fridley, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Jan. 26, 1976, Ser. No. 652,005

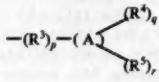
Int. Cl.[2] C07D *215/40*

U.S. Cl. 260—283 SA **96 Claims**

1. Compounds of the structure:



where R is selected from the group consisting of alkyl and alkenyl of 8 to 20 carbon atoms and



where R^3 is an alkylene of 1 to about 20 carbon atoms, p is 0 or 1, A is a monocyclic hydrocarbon ring or a bicyclic hydrocarbon ring wherein the ring or rings are 5 or 6 membered, q is a whole integer selected from 1, 2 and 3, r is 0 or 1, and $q + r =$ 1 to 3, R^4 is an alkyl or alkenyl of up to about 20 carbon atoms such that the total number of carbon atoms in $(R^4)_q$ is at least 8 with the proviso that when q is 2 at least one R^4 contains 5 or more carbon atoms and when q is 2 or 3 and more than one of the R^4 groups are branched chain the branched chain groups are not on adjacent carbon atoms, R^5 is —Cl, —Br, $—NO_2$ or —O—R^6 wherein R^6 is a hydrocarbon group radical of from 1 to about 20 carbon atoms, n is 0, 1 or 2 with the proviso that when n is 2 the R^1 substituents are not on adjacent carbon atoms, m is 0 or 1 and R^1 and R^2 are selected from the group consisting of hydrocarbon groups of from 1 to 5 carbon atoms, —Cl, —Br, NO_2 and —O—R^6, said compounds being further characterized as having solubilities of at least 2% by weight in an essentially water-immiscible, liquid hydrocarbon solvent having a flash point of at least 150° F and also further characterized in that the Cu++ complexes thereof have solubilities of at least 2% by weight in the said solvent.

4,100,164

2,6-METHANO-3-BENZAZOCINES

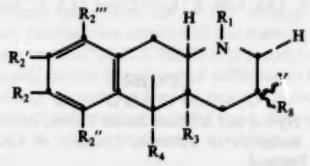
William F. Michne, Poestenkill, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 695,977, Jun. 14, 1976, abandoned, and Ser. No. 576,313, May 12, 1975, abandoned, said Ser. No. 695,977 is a continuation-in-part of said Ser. No. 576,313, which is a continuation-in-part of Ser. No. 471,571, May 20, 1974, Pat. No. 3,932,422. This application Nov. 12, 1976, Ser. No. 741,227

Int. Cl.[2] C07D *215/04, 215/08, 215/36, 215/48*

U.S. Cl. 260—287 B **39 Claims**

1. A compound having the formula



where R_1 is hydrogen, lower-alkyl, lower-alkanoyl (only when R_4 is hydrogen), lower-alkenyl, lower-alkynyl, halo-lower-alkenyl, cycloalkyl, cycloalkyl-lower-alkyl, phenyl-lower-alkyl, phenyl-lower-alkyl substituted in the phenyl ring by a single trifluoromethyl or by from one to two members of the group consisting of halogen, lower-alkyl, hydroxy, lower-alkanoyloxy, lower-alkoxy, lower-alkylmercapto, amino, lower-alkanoyl-amino or a single methylenedioxy attached to adjacent carbon atoms, or R_1 is 2- or 3-furylmethyl or such 2- or 3-furylmethyl substituted on the unsubstituted ring carbon atoms by from one to three methyl groups; R_2, R_2', R_2'' and R_2''' are each hydrogen, or three of them are hydrogen and the fourth is halogen, lower-alkyl, hydroxy, lower-alkanoyloxy, lower-alkoxy, lower-alkylmercapto, trifluoromethyl, nitro, amino, lower-alkanoylamino, lower-alkoxycarbonylamino or phenyl, or two of the adjacent such groups together are methylenedioxy; R_3 is hydrogen or lower-alkyl; R_4 is hydrogen, lower-alkyl, lower-alkoxy-lower-alkyl, hydroxy-lower-alkyl, lower-alkylthio-lower-alkyl, lower-alkylsulfinyl-lower-alkyl, phenylthio-lower-alkyl, phenylsulfinyl-lower-alkyl, lower-alkenyl or halo-lower-alkyl, or R_3 and R_4 together are divalent lower-alkylene, $—(CH_2)_n—$, where n is one of the integers 3 or 4; R_8 is hydrogen or lower-alkyl; and Y is carboxy, cyano, carbo-lower-alkoxy, COR_5, COO-lower-alkylene-cycloalkyl, COO-lower-alkylene-phenyl, or a group of the formula:

where R_5 and R_6 are the same or different members selected from the group consisting of hydrogen, lower-alkyl, cycloalkyl-lower-alkyl, phenyl or phenyl-lower-alkyl; and R_7 is hydrogen, lower-alkanoyl, benzoyl, or benzoyl substituted by a single trifluoromethyl or by one to three sterically compatible members of the group consisting of lower-alkyl, lower-alkoxy, hydroxy or halo, and wherein cycloalkyl, all occurrences, is a group having from 3 to 7 carbon atoms or is alkyl-substituted cycloalkyl having a total of from 3 to 8 carbon atoms, 3 to 7 of which are cycloalkyl ring carbon atoms, or an acid-addition salt thereof.

4,100,165
IMIDAZO [2,1-a]ISOQUINOLINES

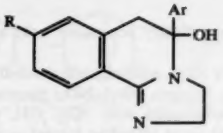
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 587,544, Jun. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 523,141, Nov. 12, 1974, abandoned. This application Jul. 22, 1976, Ser. No. 707,682

Int. Cl.[2] C07D *471/04;* A61K *31/47*

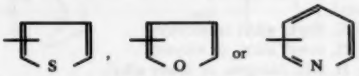
U.S. Cl. 260—288 CF 13 Claims

1. A compound of the formula



where

Ar represents



R represents H, halo having an atomic weight of 19–36, or methyl,

or a pharmaceutically acceptable acid addition salt thereof.

4,100,166
NOVEL CIS N-CYCLOPROPYLMETHYL DECAHYDROISOQUINOLINE

Dennis M. Zimmerman, Mooresville, and Winston S. Marshall, Bargersville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

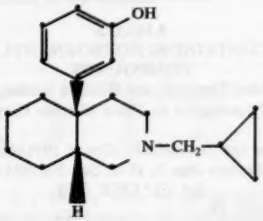
Continuation-in-part of Ser. No. 477,222, Jun. 7, 1974, Pat. No. 4,001,248. This application Oct. 22, 1976, Ser. No. 734,895

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

Int. Cl.[2] C07D *217/04;* A61K *31/47*

U.S. Cl. 260—289 D 2 Claims

1. A compound of the formula:



and its pharmaceutically-acceptable acid addition salts.

4,100,167
PRODUCTION OF 1-AMINOALKANE-1, 1-DIPHOSPHONIC ACIDS USING PHOSPHOROUS ACID AND NITRILES IN A NON-AQUEOUS SYSTEM

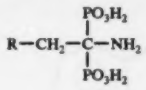
Radhakrishnan Selvarajan, Oak Park, and Edward G. Ballweber, Glenwood, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed May 9, 1977, Ser. No. 794,887

Int. Cl.[2] C07D *213/73;* C07F *9/38*

U.S. Cl. 260—296 R 3 Claims

1. A process for producing 1-amino-alkane-1,1-diphosphonic acids of the formula,



which comprises reacting a nitrile of the formula, [R—CH_2—C≡N]R—CH_2—C≡N, with at least 2 moles of phosphorous acid in the presence of a high boiling hydrocarbon liquid suspending agent at a temperature ranging between 140°–170° C. for a period of time to sufficiently convert the nitrile and the phosphorous acid into the aminoalkane-1,1-diphosphonic acid and then recovering said aminoalkane-1,1-diphosphonic acid and wherein in the above formula R is selected from the group consisting of hydrogen, alkyl with 1–18 carbon atoms, phenyl, phenylalkyl where alkyl has 1–18 carbon atoms, substituted phenyl wherein the phenyl moiety contains a sulfonic acid group or halo group, and pyridyl.

4,100,168
2,5 OR 2,6-DISUBSTITUTED BENZOXAZOLES

David William Dunwell, Camberly; Delme Evans, Peter, and Terence Alan Hicks, Farnborough, all of England, assignors to Lilly Industries Ltd., London, England

Division of Ser. No. 655,668, Feb. 4, 1976, Pat. No. 4,025,637, which is a continuation-in-part of Ser. No. 515,133, Oct. 16, 1974, abandoned. This application Feb. 7, 1977, Ser. No. 766,309

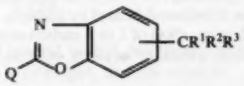
Claims priority, application United Kingdom, Sep. 20, 1974, 49260/74

Int. Cl.[2] C07D *263/54, 263/58*

U.S. Cl. 260—299 2 Claims

1. A benzoxazole of formula (III):

(III)



where the —$CR^1R^2R^3$ group is at the 5- or 6-position of the benzoxazole nucleus, R^1 is H, R^2 is H or CH_3, R^3 is -CN, COOH or an alkali or alkaline earth metal, aluminum or ammonia salt thereof, or the group $COOR^5$ wherein R^5 is C_1-C_4 alkyl and Q is —SH or halogen.

4,100,169
THIAZOLYLPHTHALIDE COMPOUNDS

Jean Claude Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

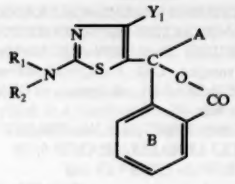
Filed Nov. 5, 1975, Ser. No. 629,156

Claims priority, application Switzerland, Nov. 14, 1974, 15189/74

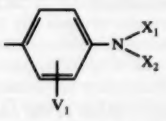
Int. Cl.[2] C07D *277/38*

U.S. Cl. 260—306.8 R 8 Claims

1. A thiazolylphthalide compound of the formula

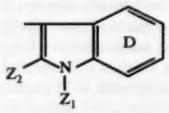


wherein A represents a p-aminophenyl radical of formula



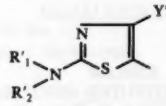
or a 3-indolyl radical of formula

(1b)



or a 2-thiazolyl radical of formula

(1c)



each of R_1R_2, X_1, X_2, R_1' and R_2' independently represents hydrogen, alkyl of 1 to 12 carbon atoms, alkoxyalkyl of 2 to 8 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, or unsubstituted or substituted benzyl or phenyl wherein the substituents are independently selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 2 to 5 carbon atoms, acyl of 1 to 4 carbon atoms, nitro, halogen and amino substituted by alkyl of 1 to 4 carbon atoms or benzyl,

each of Y_1 and Y_1' represents hydrogen, alkyl of 1 to 12 carbon atoms, cycloalkyl or 5 or 6 carbon atoms or said unsubstituted or substituted benzyl or phenyl,

V_1 represents hydrogen, alkyl of 1 to 2 carbon atoms, alkoxy of 1 to 12 carbon atoms or acyloxy of 2 to 12 carbon atoms,

Z_1 represents hydrogen, alkyl of 1 to 12 carbon atoms, benzyl or β-cyanoethyl,

Z_2 represents hydrogen, alkyl of 1 to 12 carbon atoms or phenyl, and

wherein the benzene rings B and D independently are unsubstituted or substituted by halogen, nitro or by an amino group which is unsubstituted or substituted by alkyl of 1 to 6 carbon atoms.

4,100,170

ANORECTIC ADAMANTANE DERIVATIVES AND METHOD OF USING THE SAME

Bola Vithal Shetty, Rochester, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

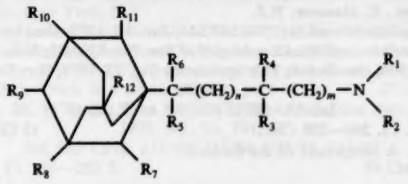
Division of Ser. No. 691,182, Dec. 18, 1967, abandoned. This application Aug. 13, 1971, Ser. No. 171,736

Int. Cl.[2] A01N *9/20, 9/24*

U.S. Cl. 424—325 **5 Claims**

1. The method of curbing appetite in an animal which comprises administering to the animal an amount effective to curb appetite of a compound of the formula:

(I)



or their pharmaceutically acceptable acid addition salts, in which

R_1 = H, lower alkyl, aralkyl, aralkyl substituted with NH_2, OH, OCH_3, halogen, alkyl, NO_2; phenoxy alkyl or phenoxyalkyl substituted with NH_2, OH, OCH_3, halogen, alkyl, or NO_2; acyl including formyl or acetyl;

R_2 = H, lower alkyl, COO-lower alkyl, aralkyl, aralkyl substituted with NH_2, OH, OCH_3, halogen, alkyl, NO_2; phenoxyalkyl or phenoxyalkyl substituted with NH_2, OH, OCH_3, halogen, alkyl, or NO_2; acyl including formyl or acetyl,

R_3 = H, lower alkyl or alkynyl;

R_4 = H, lower alkyl, or alkynyl;

R_5 = H, OH, halogen, or lower alkyl;

R_6 = H, OH, halogen, or lower alkyl; or

R_5 and R_6 together represent a carbonyl oxygen;

R_7 = H, lower alkyl, halogen, hydroxy, alkoxy, amino or substituted amino, trifluoromethyl, sulfamyl, nitro, phenyl;

R_8, R_9, R_{10}, R_{11}, R_{12} are any of R_7;

n = 0 to 4;

m = 0 to 4;

4,100,171

ANTIBIOTIC X-14547

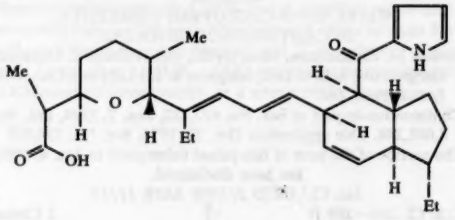
John Westley, Clifton, and Chao-Min Liu, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 6, 1976, Ser. No. 712,286

Int. Cl.[2] C07D *207/32*

U.S. Cl. 260—326.33 **2 Claims**

1. A compound of the formula



and the pharmaceutically acceptable salts thereof.

4,100,172

SULFUR CONTAINING NORBORNANYL SILICON COMPOUNDS

Jeffrey Y. P. Mui, Ossining, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

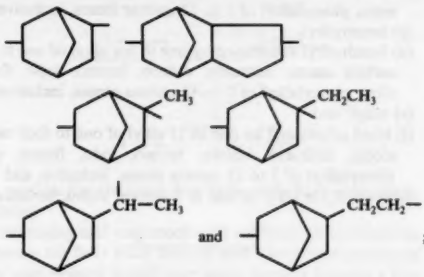
Continuation of Ser. No. 187,551, Oct. 7, 1971, abandoned. This application Jun. 7, 1976, Ser. No. 694,028

Int. Cl.[2] C07F *7/08*

U.S. Cl. 260—327 H **10 Claims**

1. Sulfur substituted norbornyl substituted compounds characterized by having present therein the structure:

wherein the free valences of the silicon atom are bonded to one or more monovalent hydrocarbon groups and hydrolyzable groups, R is one of the polyvalent cycloaliphatic hydrocarbon radicals characterized as follows:



x has the value of 2 or 3; provided that when x is 2 each sulfur atom is bonded to hydrogen to form a mercaptan, and when x is 2, the two mercaptans are attached to separate carbon atoms and such carbon atoms are adjacent to one another, and when x is 3, the sulfur atoms form a trisulfide wherein each sulfur atom is bonded to another sulfur atom and the terminal valences of the trisulfide are bonded to vicinal carbon atoms of R.

4,100,173

DIBENZ[B,F]OXEPIN DERIVATIVES

Max Gerecke; Emilio Kyburz, both of Reinach, Switzerland, and Jean-Pierre Kaplan, Le Plessis Robinson, France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

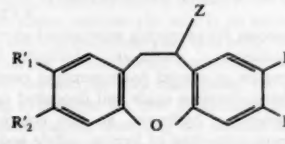
Division of Ser. No. 534,033, Dec. 18, 1974, Pat. No. 4,032,525. This application Mar. 18, 1977, Ser. No. 778,897

Claims priority, application Switzerland, Jan. 4, 1974, 62/74; Nov. 20, 1974, 15369/74

Int. Cl.[2] C07D *313/14*

U.S. Cl. 260—333 **2 Claims**

1. A compound of the formula



wherein Z is a leaving atom or group selected from the group consisting of halogen, alkyl-substituted sulfonyloxy and aryl-substituted sulfonyloxy; R'_1 is methyl and R'_2 is hydrogen; R'_3 is hydrogen and R'_4 is fluoro.

4,100,174

PROCESS FOR THE PREPARATION OF 2-(5H-DIBENZO[a,d]CYCLOHEPTEN-5-ON-2-YL)ACETIC, PROPIONIC AND BUTYRIC ACIDS AND INTERMEDIATES

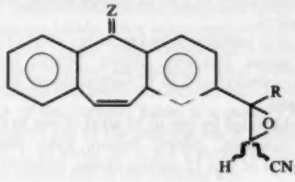
Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 611,053, Sep. 8, 1975, Pat. No. 4,011,241. This application Dec. 6, 1976, Ser. No. 748,983

Int. Cl.[2] C07D *317/72*

U.S. Cl. 260—340.9 R **2 Claims**

1. A compound represented by the formula



wherein R is hydrogen, methyl or ethyl and Z is a conventional ketal protecting group selected from the group consisting of dimethyl-, diethyl-, ethylene-, 1,3-propylene-, 2,2-dimethyl-1,3-propylene-, 1,4-butylene-, 2,3-butylene- and dibenzyl- ketals.

4,100,175

CLAISEN INTERMEDIATES

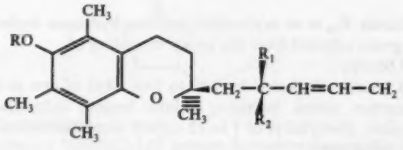
Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 638,382, Dec. 8, 1975, Pat. No. 4,029,678, which is a continuation-in-part of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169. This application Mar. 15, 1977, Ser. No. 777,808

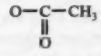
Int. Cl.[2] C07D *311/72*

U.S. Cl. 260—345.5 **1 Claim**

1. A compound of the formula



wherein R is trityl, benzyl, benzhydryl or lower alkenyl; one of R_1 and R_2 is hydrogen, and the other is



with the proviso that when R_1 is hydrogen, the 2–3 double bond has a trans configuration and that when R_1 is other than hydrogen the 2–3 double bond has a cis configuration.

4,100,176

4,5-DIDEHYDRO-6-HYDROXY-2β-ARYLMETHOXYMETHYL-4α-TETRAHYDROPYRANACETIC ACIDS

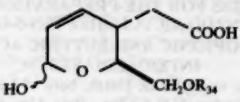
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,895, Apr. 14, 1976, Pat. No. 4,032,542. This application Apr. 4, 1977, Ser. No. 784,476

Int. Cl.[2] C07D *309/22*

U.S. Cl. 260—345.7 P **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

(a) benzyl,

(b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(c) benzhydryl,

(d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(e) trityl, and

(f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

4,100,177

4,5-DIDEHYDRO-6-HYDROXY-2-ARYLMETHOXYMETHYL-4α-TETRAHYDROPYRANACETIC ACID ALKYL ESTERS

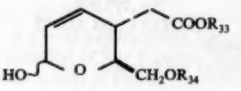
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,895, Apr. 14, 1976, Pat. No. 4,032,542. This application Apr. 4, 1977, Ser. No. 784,175

Int. Cl.[2] C07D *309/22*

U.S. Cl. 260—345.8 P **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

(a) benzyl,

(b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(c) benzhydryl,

(d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(e) trityl, and

(f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive; and

wherein R_{33} is alkyl of one to 5 carbon atoms, inclusive.

4,100,178

4,5-DIDEHYDRO-6-METHOXY-2-ARYLMETHOXYMETHYL-4α-TETRAHYDROPYRANACETIC ACID ALKYL ESTERS

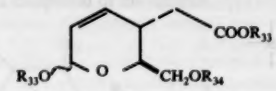
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,895, Apr. 14, 1976, Pat. No. 4,032,542. This application Apr. 4, 1977, Ser. No. 784,178

Int. Cl.[2] C07D *309/22*

U.S. Cl. 260—345.8 P **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

(a) benzyl,

(b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(c) benzhydryl,

(d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(e) trityl, and

(f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive; and

wherein R_{33} is alkyl of one to 5 carbon atoms, inclusive.

4,100,179

PREPARATION OF CITRACONIC ANHYDRIDE

Rudolph G. Berg, Groton, and Donald S. Hetzel, New London, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 482,486, Jun. 24, 1974, abandoned. This application Jan. 7, 1977, Ser. No. 757,626

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 **2 Claims**

1. A process for preparing citraconic anhydride essentially free of 2,4-dimethylfuran which comprises contacting a gaseous mixture of about 0.4 to 2% by volume of mesityl oxide and air with a non-supported, fused vanadium oxide containing catalyst at a temperature of from about 390° to 460° C until substantial citraconic anhydride is produced, said catalyst containing 0.1 to 0.9 parts by weight of antimony, 0.05 to 0.35 parts by weight of nickel, 0 to 0.02 parts by weight of chromium, 0 to 0.02 parts by weight of silver and 0 to 0.02 parts by weight of lithium, said parts by weight being parts by weight of recited element per part by weight of vanadium and said antimony, nickel, chromium, silver and lithium being present in said catalyst as oxides or hydroxides.

4,100,180

PROCESS FOR HYDROGENATING UNSATURATED ALDEHYDES TO UNSATURATED ALCOHOLS

Yataro Ichikawa; Nobuo Suzuki, and Toru Sawaki, all of Iwakuni, Japan, assignors to Teijin, Limited, Osaka, Japan

Filed Dec. 23, 1975, Ser. No. 643,953

Claims priority, application Japan, Dec. 26, 1974, 49-148267; Dec. 26, 1974, 49-148268

Int. Cl.[2] C07C *29/14*; C07D *307/42*

U.S. Cl. 260—347.8 **5 Claims**

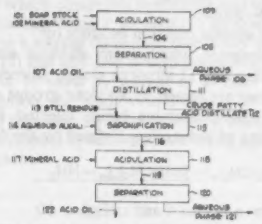
1. An improved process for preparing unsaturated alcohols by catalytic hydrogenation of unsaturated aldehydes with hydrogen in the presence of a solid hydrogenating catalyst, said catalyst comprising platinum oxide and deposited on its surface in an atmosphere of hydrogen, an iron compound selected from the group consisting of ferrous sulfate and ferrous acetate and a zinc compound selected from the group consisting of zinc sulfate and zinc acetate, wherein the platinum oxide is reduced by the hydrogen in the presence of the iron and zinc compounds.

4,100,181

PROCESS FOR OBTAINING FREE FATTY ACIDS FROM SOAP STOCK

C. Frank Phillips, and Dwight E. Leavens, both of Panama City, Fla., assignors to SCM Corporation, Cleveland, Ohio

Filed May 10, 1977, Ser. No. 795,513
Int. Cl.[2] C11C *1/04*
U.S. Cl. 260—416 12 Claims



1. A process for obtaining free fatty acids from soap stock, comprising:

(a) acidulating said soap stock with sufficient mineral acid to liberate the fatty acids from at least a major proportion of the soap present in said soap stock, thereby forming a first acid oil phase and a first aqueous saline phase;

(b) separating said first acid oil phase from said first aqueous saline phase;

(c) vacuum distilling the separated first acid oil phase to produce a first crude fatty acid distillate;

(d) saponifying the still residue from (c) with a stoichiometric excess of aqueous alkali;

(e) acidulating the saponified product from (d) with sufficient mineral acid to liberate the fatty acids from at least a major proportion of the soap present therein, thereby forming a second acid oil phase comprising predominantly free fatty acids and a second aqueous saline phase; and

(f) separating said second acid oil phase from said second aqueous saline phase.

4,100,182

METHOD OF MAKING ADJUVANT FOR ELASTOMERIC COMPOSITION

Frank Stephen Martin, Cranston; Terence Melvin, North Kingstown, and Joseph Kirby Pieroni, Providence, all of R.I., assignors to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 441,716, Feb. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 284,303, Aug. 28, 1972. This application May 11, 1976, Ser. No. 685,249
Int. Cl.[2] C07F *3/06*
U.S. Cl. 260—429.9 8 Claims

1. A method of making an adjuvant for an elastomer comprising slurrying zinc oxide in a volatile liquid medium selected from the group consisting of water and an alkanol, the concentration of zinc oxide in the slurry being from 31 to 65 percent by weight, thereafter rapidly adding to the slurry, while agitating the slurry, methacrylic acid in an amount such as to provide a zinc oxide-methacrylate acid molar ratio of from 0.8:1 to 2:1 whereby an exothermic reaction between the zinc oxide and the methacrylic acid takes place, the said liquid medium serving to dissipate the heat liberated by the exothermic reaction, subsequently removing the volatile liquid medium from the resulting reaction product to provide a dried product, and grinding the resulting dried product at least to a fineness sufficient to pass a 200 mesh sieve, the resulting product being of white color and having zinc oxide and methacrylic acid combined in the proportions required by basic zinc methacrylate.

4,100,183

PROCESS FOR PREPARING CUPROUS ALUMINUM TETRAHALIDE COMPLEXING AGENTS

Christopher P. Christenson, Lake Jackson, Tex.; John W. Faller, Hamden, Conn., and Gary M. McNamee, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 2, 1977, Ser. No. 793,205
Int. Cl.[2] C07F *1/08*
U.S. Cl. 260—438.1 7 Claims

1. In a process for preparing cuprous aluminum tetrahalide complexing agents by reacting a cuprous halide containing contaminating quantities of cupric halide with an aluminum trihalide, the improvement which comprises treating the contaminated cuprous halide, prior to reacting with the aluminum trihalide, with an organo metal compound selected from the group consisting of metal alkyls, metal alkyl halides or metal alkoxides, wherein said metal is selected from Groups IA, IIA, IIB, and IIIA of the Periodic Table, in a quantity sufficient to reduce the cupric ion to the cuprous ion at a temperature of from about 0° C to about 70° C for a period of time sufficient to reduce the cupric ion to the cuprous ion.

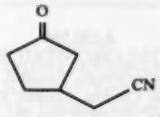
4,100,184

PROCESS FOR PRODUCING 3-CYANOMETHYL CYCLOPENTANONE DERIVATIVES

Kiyoshi Kondo, Yamato; Daiei Tunemoto, Sagamihara; Kikuo Sugimoto, Fujino, and Yuriko Takahatake, Tokyo, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

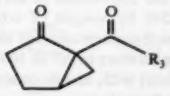
Continuation-in-part of Ser. No. 661,263, Feb. 25, 1976. This application Feb. 15, 1977, Ser. No. 768,908
Claims priority, application Japan, Feb. 27, 1976, 51-20076
Int. Cl.[2] C07C *120/00, 121/46*
U.S. Cl. 260—464 6 Claims

1. A method for producing a fragrant 3-cyanomethylcyclopentanone jasmonoide intermediate having the formula:



which comprises:

reacting a bicyclo[3,1,0] hexane derivative having the formula:



wherein R^3 represents alkoxy or alkyl, with a cyanating agent selected from the group consisting of hydrogen cyanide, acetone cyanohydrin and metal cyanides under basic conditions in an inert solvent; and

eliminating said

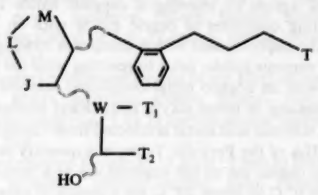
group when said R^3 is alkoxy, by first hydrolyzing said cyanated hexane derivative and then decarboxylating said hydrolyzed hexane derivative or by heating said cyanated hexane derivative in the presence of an alkali metal salt when said R^3 group is alkyl.

4,100,185
CYCLOHEXANONE 5,6-BENZO ANALOGUES OF PROSTAGLANDIN E

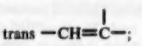
Robert Thomas Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 671,423, Mar. 29, 1976. This application Apr. 20, 1977, Ser. No. 789,132
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—465 F 3 Claims

1. A compound of the formula,



in which:
T is cyano;
M is carbonyl;
L is methylene;
J is ethylene;
W is



T_1 and T_2 are attached to adjacent carbon atoms;
T_1 is hydrogen only if T_2 is loweralkyl; and
T_2 is selected from the group consisting of loweralkyl having 1–5 carbon atoms or a polymethylene radical having 4–6 carbon atoms;
provided, however, that T_2 is the polymethylene radical only when it is joined with W to form a cycloalkylidene radical having 6–8 carbon atoms.

4,100,186
ORGANIC NITRILES

Donald Wright, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 22, 1977, Ser. No. 790,001
Claims priority, application United Kingdom, May 24, 1976, 21401/76
Int. Cl.[2] C07C *120/00, 121/20*
U.S. Cl. 260—465.8 D 5 Claims

1. A process for the conversion of acrylonitrile to a dimer product, at least 85% by weight of which consists of 1,4-dicyanobutenes, which process consists essentially of reacting acrylonitrile at a temperature of 20° to 100° C and a pressure of 0.2 to 20 bars (absolute) with, as sole catalyst, an organic phosphite of the general formula

in which each of R, R′ and R″ represents an alkyl radical having from 1 to 6 carbon atoms, in a liquid medium which is a solvent for the said catalyst, consists essentially of an alcohol having up to 6 carbon atoms as proton donor or of a mixture of said alcohol with a hydrocarbon solvent, and contains less than 1 mole of water per mole of catalyst, the acrylonitrile forming at least 5% but less than 50% by weight, and the said organic phosphite forming from 0.01% to 5% by weight of the total liquid reaction mixture.

4,100,187
OLEFIN-THIONOPHOSPHINE SULFIDE REACTION PRODUCTS, THEIR DERIVATIVES AND USE THEREOF AS OIL AND FUEL ADDITIVES

Stanley J. Brois, Westfield, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

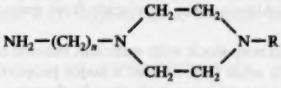
Division of Ser. No. 452,955, Mar. 20, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 622,073
Int. Cl.[2] C07F *9/04, 9/38*
U.S. Cl. 260—502.5 8 Claims

1. The oil soluble reaction product of:
(A) a polyamine which is an alkylene amino compound containing 2 to 12 nitrogen atoms, wherein pairs of nitrogen atoms are joined by alkylene groups of 2 to 4 carbon atoms, said polyamine being selected from the group consisting of polyamines defined by the fomulae:

(a) $NH_2(CH_2)_n - [NH(CH_2)_n]_m - NH_2$

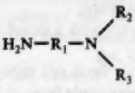
wherein: n is 2 to 4 and m is 0 to 10;

(b)

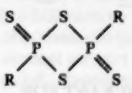


wherein: n is 2 to 3 and R is selected from the group consisting of hydrogen and aminoalkyl radicals of 2 to 3 carbon atoms; and

(c)



wherein R_1 is a C_2 to C_4 alkylene radical, and R_2 and R_3 are C_1 to C_5 alkyl radicals; and
(B) an oil soluble olefin-thionophosphine sulfide adduct of (1) an olefin polymer having at least one double bond, and (2) a dimeric thionophosphine sulfide having the structure:



wherein, R is an organic radical selected from the group consisting of C_1 to C_{18} alkyl, C_6 to C_{18} cycloalkyl, and C_6 to C_{18} aryl radicals; said adduct being formed by heating said olefin polymer and said sulfide together, under anhydrous conditions, at a temperature in the range of about 100 to 250° C., with the evolution of H_2S, said olefin polymer having a molecular weight in the range of about 400 to 100,000 and being selected from the group consisting of:
(a) unsaturated hydrocarbon polymers of C_2 to C_5 mono-olefins; and
(b) copolymers of about 30 to 85 mole % ethylene, about 15 to 70 mole % C_3 to C_5 mono-alpha olefin, and about 2 to 15 mole % of C_4 to C_{14} non-conjugated diene;
wherein said adduct is the reaction product of equimolar proportions of said sulfide with said olefin polymer of group (a) above; and said adduct is the reaction product formed by reacting in the range of about 0.05 to 1.0 molar proportion of said sulfide per molar proportion of said diene, when reacted with the olefin polymer of group (b) above;
and wherein about a molar proportion of said adduct is reacted with said polyamine at about 0° to about 100° C., in a relative proportion of about 0.1 to 0.5 mole of polyamine per atom of phosphorus in said adduct.

4,100,188
CHEMICAL PROCESS

James T. F. Kao, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 27, 1972, Ser. No. 248,053
Int. Cl.[2] C07C *59/12*
U.S. Cl. 260—535 P 16 Claims

1. A process for recovering an alkali metal, ammonium or amine salt of carboxyalkoxy succinic acid from an aqueous solution thereof which comprises combining said solution with lower alkanol having from 1 to about 3 carbon atoms per molecule to form a system consisting essentially of (1) water, (2) alkanol, and (3) said salt, said system containing from about one-half to about 10 parts by weight of alcohol per part of aqueous salt solution, the weight ratio of salt to water being from about 1:10 to about 1:1, said system containing greater than a saturation amount of salt, and recovering a precipitate of salt from said system.

4,100,189
RECOVERY OF ACETIC ACID FROM DILUTE AQUEOUS SOLUTIONS THEREOF

Jules Mercier, Melle-Deux-Sevres, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jan. 21, 1976, Ser. No. 651,195
Claims priority, application France, Apr. 25, 1975, 75 12799
Int. Cl.[2] C07C *51/46, 51/48*
U.S. Cl. 260—541 18 Claims

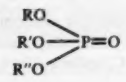
1. A process for the recovery of acetic acid from dilute aqueous solutions thereof containing from about 0.5 to about 3.0% acetic acid, comprising extracting such a dilute aqueous solution with an organic solvent, neutralizing the acidic extract with aqueous ammonia, whereby there are separated an organic phase and an ammonium acetate containing aqueous phase, withdrawing said aqueous phase, thermally decomposing the ammonium acetate present in said aqueous phase at atmospheric pressure and at a temperature within the range of from about 90° C. to about 130° C. in the presence of an agent capable of forming with water a minimum boiling point heteroazeotrope, and thence recovering the acetic acid of decomposition.

4,100,190
PRODUCTION OF PERCHLOROMETHYL MERCAPTAN

Vincent C. Martines, White Plains, N.Y., and Ramsey G. Campbell, Berkeley, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 22, 1976, Ser. No. 753,122
Int. Cl.[2] C07C *149/16, 148/00*
U.S. Cl. 260—543 H 7 Claims

1. In a method for producing perchloromethyl mercaptan via the catalytic reaction of chlorine and carbon disulfide, the improvement which comprises contacting the reactants with additive selected from the group consisting of phosphates, phosphites, or blends thereof, said phosphates having the following structure:



wherein R, R′ and R″ independently are hydrogen, hydrocarbyl, or substituted hydrocarbyl, however, R, R′ and R″ cannot all be hydrogen simultaneously, and said phosphites having the following structure:

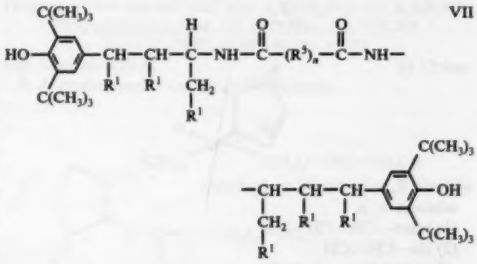
wherein R, R′ and R″ independently are hydrogen, hydrocarbyl, or substituted hydrocarbyl, however, R, R′ and R″ cannot all be hydrogen simultaneously, said additive being contacted with said reactants in amounts effective to suppress the formation of carbon tetrachloride and sulfur monochloride.

4,100,191
4-(M,M′-DI-T-BUTYL-P-HYDROXYPHENYL)-BUTYL-2-DIAMIDES

Roman Fischer, Mutterstadt; Werner Fliege, Otterstadt; Wolfgang Koernig, Mannheim, and Peter Horn, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Division of Ser. No. 443,822, Feb. 19, 1974, Pat. No. 4,026,952.
This application Nov. 18, 1976, Ser. No. 743,085
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1973, 2309375; Feb. 24, 1973, 2309376; Feb. 24, 1973, 2309377
Int. Cl.[2] C07C *103/147, 103/19, 103/24*
U.S. Cl. 260—557 R 9 Claims

1. 4-(*m,m′*-di-t-butyl-p-hydroxyphenyl)-butyl-2-bisamides of the formula



VII

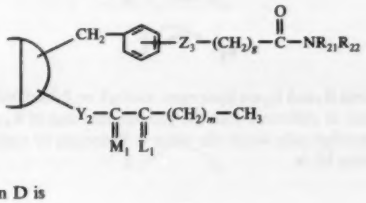
in which each R^1 respectively is hydrogen or an aliphatic radical, R^5 is an aliphatic, cycloaliphatic, araliphatic, or aromatic radical and *n* is 0 or 1.

4,100,192
INTER-PHENYLENE-PG AMIDES

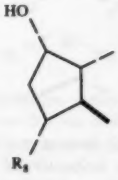
Walter Morozowich, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 18, 1977, Ser. No. 788,455
Int. Cl.[2] C07C *103/20*
U.S. Cl. 260—558 R 46 Claims

1. A prostaglandin analog of the formula



wherein D is



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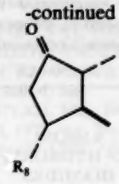
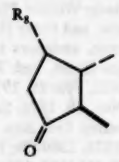
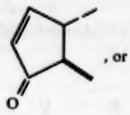
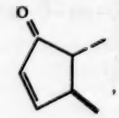






, or



wherein R_8 is hydrogen or hydroxy;
wherein Y_2 is
(1) trans—CH=CH—, or
(2) cis—CH=CH—,
wherein g is one, 2, or 3;
wherein Z_3 is oxa or methylene;
wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is

or

wherein R_5 is hydrogen or methyl;
wherein m is one to 5, inclusive; and
wherein R_{21} and R_{22} are
(i) hydrogen;
(ii) alkyl of one to 12 carbon atoms, inclusive;
(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(iv) aralkyl of 7 to 12 carbon atoms, inclusive;
(v) phenyl;
(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy or nitro;
(vii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(viii) dihydroxyalkyl of one to 4 carbon atoms; or
(ix) trihydroxyalkyl of one to 4 carbon atoms;
with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl.

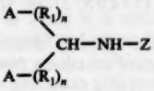
4,100,193

NOVEL DIBICYCLO [2.2.2] OCTYL AND DIBICYCLO [2.2.2] OCTENYL POLYAMINES AND METHODS FOR THEIR PREPARATION

Nathaniel Grier, Englewood; Richard A. Dybas, Somerville, and Robert A. Strelitz, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

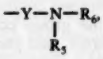
Filed Jun. 10, 1976, Ser. No. 694,639
Int. Cl.[2] C07C *83/00*
U.S. Cl. 260—563 P **25 Claims**

1. A compound of the formula:

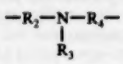


where:
each A is alike or different and is a [2.2.2] bicyclic group of the formula:

where R is alike or different and is hydrogen or C_1 to C_4 alkyl, R′ is alike or different and is hydrogen or C_1 to C_4 alkyl or R′ on adjacent carbon atoms taken together comprise an olefinic bond;
each R_1 is alike or different and is C_1 to C_4 alkylene;
each n is alike or different and is the integer 0 to 1;
Z is



where
R_5 is hydrogen, aminoethyl or aminopropyl; C_1 to C_4 hydroxyalkyl, C_2 to C_4 dihydroxyalkyl; and
R_6 is hydrogen, C_1 to C_4 hydroxyalkyl; C_2 to C_4 dihydroxyalkyl;
Y is either



or -R_2-
where
R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;
R_3 is hydrogen, C_1 to C_4 alkyl, C_1 to C_4 aminoalkyl or C_1 to C_4 hydroxyalkyl, C_2 to C_4 dihydroxyalkyl;

R_4 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

or when R_3 and R_6 taken together are ethylene, R_4 is also ethylene, and R_5 is aminoethyl, aminopropyl or aminohydroxypropyl, and acid addition salts thereof.

4,100,194

PRODUCTION OF UNSATURATED AMINES EMPLOYING A PALLADIUM COMPOUND CO-CATALYZED WITH A PHOSPHONITE LIGAND

Charles F. Hobbs, Des Peres, and Dudley E. McMackins, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 697,900, Jun. 21, 1976. This application Dec. 6, 1976, Ser. No. 747,835

Int. Cl.[2] C07C *85/18, 87/45, 87/54, 87/62*

U.S. Cl. 260—576 **10 Claims**

1. The process of producing N-(alkadienyl)amines by reaction of a conjugated diene and an aromatic amine selected from the group consisting of aniline, methylaniline, phenylenediamines, and N-phenylphenylenediamines in a hydroxylic solvent medium in the presence of a catalyst comprising a palladium compound co-catalyzed with a phosphonite ligand.

4,100,195

PROCESS FOR PREPARING DIPHENYLAMINE IN THE PRESENCE OF A BORON/FLUORINE COMPOUND AND WATER

Hans-Michael Fischler; Dieter Bauer, and Hein Quast, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 679,112, Apr. 22, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,979

Claims priority, application Fed. Rep. of Germany, May 13, 1975, 2521293

Int. Cl.[2] C07C *85/20*

U.S. Cl. 260—576 **10 Claims**

1. Process for producing diphenylamine which comprises heating aniline under pressure to temperatures of 250° to 400° C in the presence of a boron/fluorine compound devoid of metal cations and water in an amount of 0.1 to 5.0% by weight, based on the weight of aniline used.

4,100,196

PRODUCTION OF N-(ALKADIENYL)AMINES

Charles F. Hobbs, Des Peres, and Dudley E. McMackins, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 697,900, Jun. 21, 1976. This application Dec. 23, 1976, Ser. No. 753,970

Int. Cl.[2] C07C *85/18*

U.S. Cl. 260—585 D **13 Claims**

1. The process of producing N-(alkadienyl)amines by reaction of conjugated dienes and ammonia or amines having from one to about 20 carbon atoms in a hydroxylic solvent medium in the presence of a catalyst comprising a palladium compound co-catalyzed with a polymeric phosphonite ligand, said phosphonite ligand comprising a phosphonite polymerized with polyvinyl alcohol.

4,100,197

MANUFACTURE OF ECHINENONE

Hagen Jaedicke, Ludwigshafen; Joachim Paust, Neuhofen, and Joachim Schneider, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Jul. 14, 1976, Ser. No. 705,281

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1975, 2534807

Int. Cl.[2] C07C *45/02*

U.S. Cl. 260—586 P **6 Claims**

1. A process for the manufacture of echinone by oxidizing β-carotene or retro-dehydro-carotene, wherein the oxidation is carried out with iodic acid or a salt of iodic acid in a proportion of 1 to 20 moles per mole of β-carotene or retro-dehydro-carotene in the presence of the halogens bromine or iodine as a catalyst, and in the presence of an inert diluent or solvent, at from 0° to 50° C.

4,100,198

2-DECARBOXY-2-HYDROXYMETHYL-CIS-4,5-DIDEHYDRO-9-DEOXY-PGD$_2$ COMPOUNDS

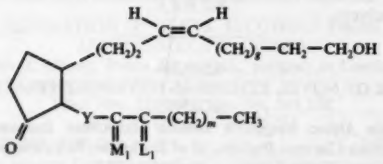
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,763

Int. Cl.[2] C07C *49/46, 49/80, 49/82*

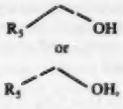
U.S. Cl. 260—586 R **22 Claims**

1. A prostaglandin analog of the formula



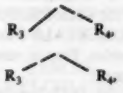
wherein Y is trans—CH=CH—;

wherein M_1 is



wherein R_5 is hydrogen or methyl;

wherein L_1 is



or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;

wherein g is one, 2, or 3; and

wherein m is one to 5, inclusive.

4,100,199

CARBORANE PURIFICATION

Gary Burr Dunks, Peekskill, and Kathy Palmer Ordonez, Scarsdale, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,212
Int. Cl.[2] C07F 5/02
U.S. Cl. 260—606.5 B 17 Claims

1. A process for the separation and purification of a carborane from a reaction mixture comprised of said carborane and undesirable tarry by-products formed during the reaction of decaborane with an acetylenic compound in the presence of a donor ligand, said process comprising the steps of:

(a) removing from said mixture any solvent in which said carborane was synthesized except when such solvent:
(i) also serves as said donor ligand,
(ii) is employed in amount in excess of the stoichiometric amount required for said reaction, and,
(iii) is selected from the group consisting of acetonitrile and propionitrile,

(b) dissolving said mixture from which any solvent has been removed in accordance with step (a) in a first solvent in which all the components of said mixture are soluble and non-reactive therewith,

(c) extracting said carborane from said mixture with a second solvent, immiscible with the solvent of either steps (a) or (b) and in which said carborane is soluble and said by-products are insoluble, and

(d) thereafter recovering said carboranes from said second solvent.

4,100,200

USE OF NOVEL ETHERS AS OXYDIMETHYLATING AGENTS

Cataldo Aldino Maggiulli; Donald MacArthur Burness, and William Clarence Perkins, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 597,950, Jul. 21, 1975, Pat. No. 4,025,542.
This application Feb. 11, 1977, Ser. No. 767,713
Int. Cl.[2] C07C 149/18; C07D 295/08
U.S. Cl. 260—609 R 4 Claims

1. In the method of oxydimethylating an organic compound with an oxydimethylating agent the improvement comprising reacting said organic compound with an oxydimethylating agent having the formula

$$R - SO_2O - CH_2 - O - CH_2 - OSO_2 - R$$

wherein R is alkyl having from 1 to 6 carbon atoms.

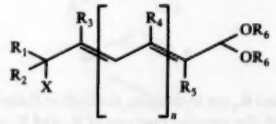
4,100,201

PROCESS FOR THE PREPARATION OF HALOGENOACETALS FROM ESTERS

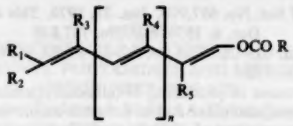
Jean-Pierre Decor, Thurins, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Feb. 23, 1977, Ser. No. 771,312
Claims priority, application France, Feb. 25, 1976, 76 05241; Jan. 13, 1977, 77 00854
Int. Cl.[2] C07C 41/06
U.S. Cl. 260—615 A 11 Claims

1. Process for the preparation of a halogeno-acetal of an ethylenically unsaturated aldehyde of the formula:



in which X represents chlorine, bromine or iodine; R_1, R_2, R_3, R_4 and R_5, which may be identical or different, represent hydrogen straight or branched alkyl of from 1 to 6 carbon atoms, or straight or branched alkenyl of from 3 to 6 carbon atoms in which the double bond is in a position other than the 1-2 position; n is 0, 1, 2, 3 or 4, it being understood that if n is greater than 1, the various symbols R_4 may be identical or different and the two symbols R_6 each represent straight or branched alkyl of from 1 to 6 carbon atoms, or they together form a straight or branched alkylene radical R'_6 of from 2 to 6 carbon atoms, optionally substituted by hydroxyl or alkoxy of from 1 to 4 carbon atoms, which comprises reacting a halogen cation chosen from Cl^+, Br^+ and I^+, with an ester of the formula:



in which R_1, R_2, R_3, R_4, R_5 and n are as defined above and R represents straight or branched alkyl of from 1 to 6 carbon atoms, in the ratio of 1 halogen cation per mole of the said ester at −40° to +80° C and in the presence of an excess of a primary or secondary alcohol of the formula R_6OH, in which R_6 is as defined above, or of a glycol of the formula HO—R'_6—OH, in which R'_6 is as defined above.

4,100,202

OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY CUPRIC COMPLEXES

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,015
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.[2] C07C 27/00, 37/00, 41/00, 45/00
U.S. Cl. 568—730 18 Claims

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 8.5–9.5 during the oxidative coupling reaction and a catalyst system comprising a cupric complex of a compound selected from the class consisting of quanidines, amides, salens, dihydrazides, triazenes, dihydroxy substituted aromatics, macrocylic polyamines and alpha, delta-polyketones.

4,100,203

OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF AN OXIME OF A KETO OR ALDEHYDE COMPOUND

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,200
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.[2] C07C 27/00, 37/00, 41/00, 45/00
U.S. Cl. 568—730 18 Claims

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 8.0–9.5 during the oxidative coupling reaction and a catalyst system comprising a cupric, manganous, or cobaltous metal complex of an oxime of a keto or aldeyhyde compound.

4,100,204

OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF A HYDROXY- OR KETO-ACID COMPOUND

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,061

The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.

Int. Cl.[2] C07C *27/00, 37/00, 41/00, 45/00*

U.S. Cl. 568—730 18 Claims

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 7.0–9.5 during the oxidative coupling reaction and a catalyst system comprising a cupric, manganous, or cobaltous metal complex of a hydroxy- or keto- acid.

4,100,205

OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF AMINOKETO COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,208

The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.

Int. Cl.[2] C07C *37/00, 27/00, 41/00, 45/00*

U.S. Cl. 568—730 18 Claims

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 7.5–10 during the oxidative coupling reaction and a catalyst system comprising a cupric, manganous, cobaltous, nickelous, ferric, or chromic metal complex of an aminoketone.

4,100,206

OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF KETO ALCOHOL COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,210

The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.

Int. Cl.[2] C07C *27/00, 37/00, 41/00, 45/00*

U.S. Cl. 568—730 17 Claims

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 7.0–9.5 during the oxidative coupling reaction and a catalyst system comprising a cupric or manganous metal complex of a keto alcohol.

4,100,207

PREPARATION OF METHYL-SUBSTITUTED PHENOLS

Thomas E. Goodwin, College Station, Tex., and Charles M. Starks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 24, 1977, Ser. No. 771,509

Int. Cl.[2] C07C *39/06*

U.S. Cl. 568—804 6 Claims

1. A method of preparing di- and tri-methyl-substituted phenols wherein the method comprises heating, at a temperature in the range of about 200° to about 575° C., a di-C_4-C_6-tertiary alkyl cresol and methanol in the presence of a catalytic amount of magnesium oxide, said magnesium oxide being present in an amount in the range of about 0.1 to about 35 expressed as volume of total liquid per hour per volume of catalyst.

4,100,208

PROCESS FOR THE PRODUCTION OF UNSATURATED COMPOUNDS

Federico Maspero, Milan, and Emilio Perrotti, S. Donato Milanese, both of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Continuation of Ser. No. 147,653, May 27, 1971, abandoned.

This application Apr. 11, 1974, Ser. No. 460,222

Claims priority, application Italy, May 29, 1970, 25267 A/70

Int. Cl.[2] C07C *29/00*

U.S. Cl. 568—902 6 Claims

1. Process for the selective production of an ethylenic compound by conversion of the corresponding acetylenic compounds which comprises reacting an acetylenic compound selected from the group consisting of 3-methyl-1-butyn-3-ol, 2-butyn-1,4-diol, 1-butyn-3-ol and 3-phenyl-1-butyn-3-ol with isopropyl alcohol in a homogeneous liquid phase in the presence of a metal complex selected from the group consisting of $IrH_3CO(P\phi_3)_2$ and $IrH_3(P\phi_3)_2$.

4,100,209

SEPARATION OF ALKYL ALCOHOLS FROM ALKYLDIMETHYLAMINES

William J. Libbey, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Nov. 12, 1976, Ser. No. 741,190

Int. Cl.[2] C07C *29/24, 85/26*

U.S. Cl. 568—918 D 9 Claims

1. A process for removing C_6–C_{18} alkanols from a mixture of C_6–C_{18} alkanols and C_6–C_{18} alkyldimethylamines wherein the process comprises (a) contacting said mixture of alkanols and alkyldimethylamines with an effective amount, in the range of about 2:1 parts to about 50:1 parts per volume of said mixture, of an immiscible solvent mixture comprising a polar solvent selected from the group consisting of dimethylformamide, 2-amino-2-methyl-1-propanol, and mixtures thereof, and a nonpolar solvent, said polar solvent and said nonpolar solvent being present in the range of about 4:1 to about 1:4, on a volume basis, and still being immiscible, (b) forming a polar phase containing a substantial amount of said C_6–C_{18} alkanols and a nonpolar phase containing a substantial amount of said C_6–C_{18} alkyldimethylamines, (c) separating said polar phase and said nonpolar phase, and (d) removing the polar solvent and nonpolar solvent from the respective polar and nonpolar phases.

4,100,210

ALKYLCHLORIDE

Jan Bertil Eriksson, Visp, Switzerland, and Zaven Armen Dadekian, Upper Saddle River, N.J., assignors to Lonza A. G., Basel, Switzerland

Filed Aug. 10, 1976, Ser. No. 713,263

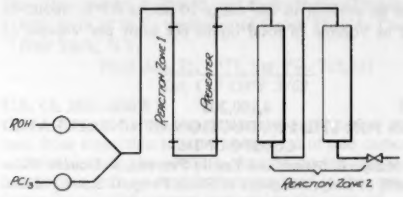
Claims priority, application Switzerland, Aug. 12, 1975, 10461/75

Int. Cl.[2] C07C *19/02*

U.S. Cl. 260—652 R 9 Claims

1. In a process for the preparation of alkyl chlorides by the reaction of an alkyl alcohol having from 4 to 22 carbon atoms with phosphorus trichloride, the improvement of performing said process in a flow line which is maintained at a pressure of from 25 to 50 atmospheres and divided into a first reaction zone, a preheater, and a second reaction zone, wherein the alcohol and the phosphorus trichloride are fed to the first reaction zone at a temperature of from 85° to 110° C. in a molar ratio of 2.85:1 to 3:1; wherein the reaction mixture from the

first reaction zone is passed to the preheater and heated to a temperature of 140° to 150° C.; and wherein the reaction mixture from said preheater is passed to the second reaction zone maintained at a temperature of 150° to 200° C. to substantially complete the reaction.



4,100,211

PROCESS FOR PREPARATION OF ETHYLENE AND VINYL CHLORIDE FROM ETHANE

Angelo Joseph Magistro, Brecksville, Ohio, assignor to The BF Goodrich Company, Akron, Ohio

Filed May 17, 1976, Ser. No. 686,908

Int. Cl.[2] C07C *21/02*

U.S. Cl. 260—656 R **7 Claims**

1. A process for the reaction of ethane to ethylene and vinyl chloride comprising (1) contacting ethane, oxygen, and a chlorine source in the presence of a solid solution catalyst of iron cations substituted for aluminum cations in a host lattice of α-Al_2O_3 at a temperature from about 400° C. to about 650° C. wherein the ethane, oxygen, and chlorine source are employed at a molar ratio of 1 mole of ethane to 0.1 to 10 moles of the chlorine source to 0.1 to 1.5 moles of oxygen, said solid solution catalyst having an iron content of from about 0.1 percent to 20 percent by weight expressed as the oxide, (2) adding an iron source to the ongoing process to regenerate the solid solution catalyst in situ, and (3) removing the products produced from the reaction area.

4,100,212

PROCESS FOR CHLORINATING LINEAR PARAFFINS

Lucio Di Fiore; Benedetto Calcagno, both of Milan, and Marcello Ghirga, Bresso, Milan, all of Italy, assignors to Societa'Italiana Resine S.p.A., Milan, Italy

Continuation of Ser. No. 97,900, Dec. 14, 1970, abandoned. This application Oct. 28, 1975, Ser. No. 626,000

Claims priority, application Italy, Dec. 23, 1969, 26200 A/69

Int. Cl.[2] C07C *17/10*

U.S. Cl. 260—660 **5 Claims**

1. A process for the non-catalytic continuous liquid-phase chlorination using gaseous chlorine of linear paraffins having 9 to 15 carbon atoms per molecule comprising:

contacting said gaseous chlorine and said linear paraffins in a reactor of an elongated tubular shape comprising a plurality of independent interconnecting reaction stages by means of baffles consisting of perforated sheets or plates in said reactor, each of said stages having a height to diameter ratio of 1:1 to 5:1, by supplying said paraffins to the base of said reactor and supplying gaseous chlorine through distributors at the bottom of each reaction stage at a linear inlet velocity of between 50 to 150 meters/sec. at a molar ratio of chlorine to paraffins of 0.1:1 to 5:1 and at a paraffins supply rate of 0.1 to 1.3 volumes of paraffins per reactor volume per hour, said chlorination reaction being carried out at temperatures from 90 to 170° C, the size of the holes in said baffles and said chlorination reaction conditions being carried out such that the gas velocity passing from one reaction stage to another, through the baffles, is between 2 and 60 cm/sec., said chlorination reaction being controlled at said temperatures using heat exchangers situated internally at each reaction stage; and recovering the reaction products at the head of the reactor.

4,100,213

ISOMERIZATION WITH CATALYST OF GRAPHITE CONTAINING INTERCALATED ACID AND FLUORIDE

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 609,334, Sep. 2, 1975, Pat. No. 4,035,434, which is a division of Ser. No. 532,146, Dec. 12, 1974, Pat. No. 3,962,133. This application Feb. 2, 1977, Ser. No. 765,133

The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.[2] C07C *5/28*

U.S. Cl. 260—666 P **7 Claims**

1. A process for isomerization of an isomerizable hydrocarbon charge selected from the group consisting of naphthenes, paraffins and mixtures thereof which comprises contacting the same at a temperature between about 0° and about 200° C, a pressure between about atmospheric and about 30 atmospheres at a liquid hourly space velocity between about 0.2 and about 10 with a catalyst consisting essentially of graphite having intercalated in the lattice thereof between about 5 and about 50 weight percent of a Lewis acid fluoride selected from the group consisting of boron trifluoride and phosphorus pentafluoride and having additionally intercalated therein between about 0.5 and about 75 weight percent of a Bronsted acid selected from the group consisting of hydrofluoric acid, hydrochloric acid, fluorosulfuric acid, trifluoromethane-sulfonic acid and mixtures thereof, the molar ratio of Bronsted acid to Lewis acid fluoride being within the range of 0.1:1 to 50:1.

4,100,214

ISOMERIZATION OF MONOCYCLIC ALKYL AROMATIC HYDROCARBONS

Francis G. Dwyer, West Chester, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 7, 1976, Ser. No. 684,512

Int. Cl.[2] C07C *5/24*

U.S. Cl. 260—668 A **10 Claims**

1. A process for effecting catalytic isomerization of xylenes which comprises contacting said xylenes in the vapor phase with hydrogen at a temperature of from about 450° to about 900° F, a pressure of from about 50 psig to about 500 psig, a hydrogen/hydrocarbon mole ratio of from about 0.1 to about 100 and a weight hourly space velocity of from about 0.1 to about 200 in the presence of from about 3 to about 30 combined weight percent, based upon weight of the xylene feed, of diluent of toluene and C_9^+ recycle material and a crystalline aluminosilicate zeolite characterized by a silica/alumina mole ratio of greater than 12 and a constraint index within the approximate range of 1 to 12 and containing cations which are selected from the group consisting of iron, nickel and cobalt.

4,100,215

SELECTIVE PRODUCTION OF PARA-XYLENE

Nai Y. Chen, Titusville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 509,188, Sep. 25, 1974, Pat. No. 4,002,697, which is a continuation-in-part of Ser. No. 421,459, Dec. 3, 1973, abandoned. This application Sep. 27, 1976, Ser. No. 727,084

Int. Cl.[2] C07C *3/52*

U.S. Cl. 260—671 M **10 Claims**

1. In a process for manufacture of xylene by reacting toluene with a methylating agent in the presence of a crystalline aluminosilicate zeolite catalyst, the improvement resulting in a proportion of para-xylene greater than the thermodynamic equilibrium proportion of total xylenes which comprises conducting the reaction at a temperature between about 400° and about 500° C in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, which has not undergone prior surface

deactivation by treatment with a compound of nitrogen or silicon, characterized by (1) a silica to alumina ratio of at least about 12, (2) a constraint index within the approximate range of 1 to 12 and (3) a crystal size greater than 1 micron.

4,100,216
PREPARATION OF BETA-METHYLTETRAMETHYLENE NORTRICYCLANE

Harry K. Myers, Jr., Aston; James E. Lyons, Wallingford, and Abraham Schneider, Overbrook Hills, all of Pa., assignors to Sun Oil Company of Pennsylvania, Philadephia, Pa.

Filed Jul. 27, 1977, Ser. No. 819,445
Int. Cl.[2] C07C *13/32*
U.S. Cl. 260—666 PY **10 Claims**

1. Process for the catalytic codimerization of norbornadiene and isoprene comprising:

(a) contacting norbornadiene and isoprene in the presence of a catalytic amount of a three-component homogeneous catalytic system consisting of cobaltic or cobaltous acetylacetonate, 1,2-bisdiphenylphosphino ethane and one of the following alkyl aluminum chlorides: diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride;

(b) having the contacting occurring at a temperature within the range from between about 20° C to about 100° C; and

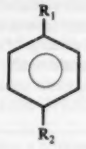
(c) continuing the contacting until the desired amount of codimer of norbornadiene and isoprene is prepared.

4,100,217
SELECTIVE PRODUCTION OF PARA-SUBSTITUTED BENZENES

Lewis Brewster Young, Kendall Park, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 704,194, Jul. 12, 1976, Pat. No. 4,049,738. This application May 3, 1977, Ser. No. 793,469
Int. Cl.[2] C07C *3/52*
U.S. Cl. 260—671 R **14 Claims**

1. A process for the selective production of para-substituted benzenes characterized by the formula:



where R_1 is ethyl and R_2 is methyl or ethyl which comprises reacting a mono alkyl benzene wherein the alkyl substituent contains 1 or 2 carbon atoms with an ethylating agent at a temperature between about 300° and about 750° C in the presence of a catalyst comprising the crystalline aluminosilicate zeolite ZSM-23.

4,100,218
ETHANE CONVERSION PROCESS

Nai Yuen Chen, Titusville, and Werner O. Haag, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,713
Int. Cl.[2] C07C *15/02, 11/04;* C10G *37/02*
U.S. Cl. 260—673 **14 Claims**

1. An ethane conversion process which comprises:

a. thermally cracking ethane at temperatures within the range from about 1500° to 1600° F, pressures within the range from about 20 to 50 psig, and steam:ethane molar ratios within the range from about 0.1–0.7:1 to produce an olefin-rich effluent in a thermal cracker wherein the ethane conversion is greater than about 60 weight percent;

b. cooling the olefin-rich effluent to a temperature within the range from about 600° to 1200° F;

c. contacting the cooled, olefin-rich effluent, without prior separation or purification, at a pressure within the range from about 0 to 200 psig and a WHSV of from about 1 to 10 with a crystalline aluminosilicate zeolite characterized by a pore dimension greater than about 5 Angstroms, a silica to alumina ratio of at least 12 and a constraint index within the range of from 1 to 12; and

d. recovering a C_5+ product suitable for use as gasoline, an LPG product, and light fuel gases.

4,100,219
SILICA-MODIFIED ZEOLITE CATALYST AND CONVERSION THEREWITH

Paul G. Rodewald, Rocky Hill, NJ, assignor to Mobil Oil Corporation, New York, N.Y.

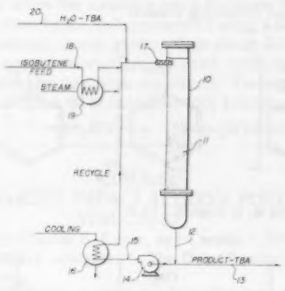
Continuation-in-part of Ser. No. 672,194, Mar. 31, 1976, Pat. No. 4,060,568. This application Dec. 23, 1976, Ser. No. 753,748
The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.
Int. Cl.[2] C07C *1/20, 1/24*
U.S. Cl. 260—682 **10 Claims**

1. A process for converting a charge consisting essentially of one or more lower monohydric alcohols having up to four carbon atoms, the ethers derived therefrom or mixtures of said alcohols and ethers to a hydrocarbon product rich in ethylene and propylene which comprises contacting said charge under conversion conditions with a catalyst composition comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12 and containing within the interior crystalline structure thereof added amorphous silica in an amount of at least about 0.3 weight percent, said catalyst being characterized by a n-hexane sorption capacity at a temperature of 90° C. and a n-hexane partial pressure of 83 mm. of mercury which is at least 1 percent less than the corresponding sorption capacity under identical conditions for the unmodified zeolite.

4,100,220
DIMERIZATION OF ISOBUTENE

William G. Bowman, and William P. Stadig, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Jun. 27, 1977, Ser. No. 810,644
Int. Cl.[2] C07C *3/10*
U.S. Cl. 260—683.15 R **13 Claims**



1. A process for the preparation of isobutene dimer comprising passing isobutene and t-butanol, water or a mixture of t-butanol and water through a fixed bed of acidic cation exchange resin catalyst in liquid phase at a temperature in the range of 55° to 160° C for a sufficient time to react isobutene, the mol ratio of t-butanol to isobutene being in the range of 0.001 to 1.0:1 and the mol ratio of water to isobutene being less than 0.06: provided that the total amount of t-butanol including

the equivalent represented by the reaction of water present with isobutene is within the mol ratio of t-butanol to isobutene range of 0.001 to 1.0:1, producing only a hydrocarbon phase, recovering said hydrocarbon phase, containing isobutene dimer, splitting said hydrocarbon phase, cooling one portion thereof to a temperature in the range of 15° to 110° C and recycling the cooled portion to the reaction.

4,100,221

UNSATURATED POLYESTER RESIN COMPOSITIONS

Beppino Passalenti, Lissone (Milan); Giorgio Brumat, Verano Brianza (Milan), and Silvio Vargiu, Casatenovo (Como), all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Aug. 5, 1977, Ser. No. 822,170

Claims priority, application Italy, Aug. 5, 1976, 26049 A/76

Int. Cl.[2] C08L *63/00*

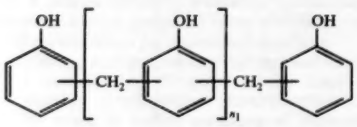
U.S. Cl. 260—835 **8 Claims**

1. An unsaturated polyester resin composition hardenable by means of peroxides, which comprises:

(a) an unsaturated polyester resin,

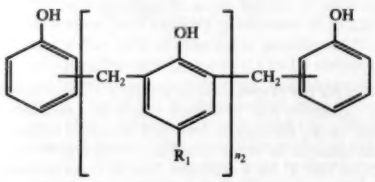
(b) a vinyl chloride polymer in an amount of from 5 to 15 parts by weight for each 100 parts by weight of unsaturated polyester resin, and

(c) from 10 to 20 parts by weight for each 100 parts by weight of unsaturated polyester resin, of an epoxy Novolak resin having an epoxy function greater than 2, or of a mixture of the latter with a liquid epoxy resin, said liquid epoxy resin being present in the mixture in an amount not exceeding 50% by weight and such that the average epoxy function of the mixture be higher than 2, and said epoxy Novolak resin being the product of the epoxidation with epichlorohydrin of a Novolak phenolic resin chosen from the following classes:



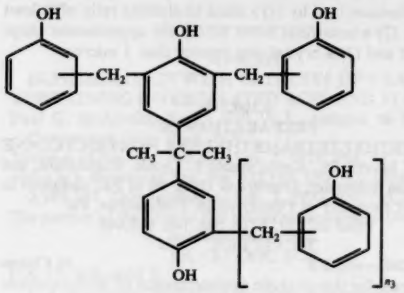
(I)

wherein n_1 is from 0.2 to 4



(II)

wherein n_2 is from 1 to 8 and R_1 is an alkyl radical with from 2 to 10 carbon atoms, and



(III)

wherein n_3 is from 0 to 1.

4,100,222

AGENT FOR IMPROVING WEATHERABILITY OF SYNTHETIC RESIN

Kyoichi Iwamoto, and Hiroshi Kakei, both of Shinnan-yoshi, Japan, assignors to Tokuyama Sekisui Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 560,778, Mar. 21, 1975, Pat. No. 3,984,491. This application Jul. 2, 1976, Ser. No. 702,100

Claims priority, application Japan, Mar. 27, 1974, 49-34833

Int. Cl.[2] C08L *27/06*

U.S. Cl. 260—837 PV **3 Claims**

1. An improved resin composition which comprises 100 parts by weight of a synthetic resin selected from the group consisting of graft-copolymers prepared by grafting vinyl chloride on copolymer of ethylene and vinyl acetate, copolymers of ethylene and vinyl chloride, chlorinated polyvinyl chloride, and 0.1–5.0 parts by weight of a reaction product which is prepared by reacting an epoxy resin selected from the group consisting of glycidyl epoxy resins, epoxidized vegetable oils and alicyclic epoxy resins, with at least one acid selected from the group consisting of cinnamic acid, α-methylcinnamic acid and o-coumaric acid.

4,100,223

PROCESS FOR THE PRODUCTION OF HIGH-IMPACT THERMOPLASTIC MOULDING COMPOSITIONS

Rolf-Volker Meyer, and Rolf Dhein, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Mar. 15, 1977, Ser. No. 777,716

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2612011

Int. Cl.[2] C08L *77/00*

U.S. Cl. 260—857 L **14 Claims**

1. A moulding composition consisting essentially of:

(1) from 60 to 93 parts, by weight, of a polyamide;

(2) from 6 to 30 parts, by weight, of a polyethylene; and

(3) from to 20 parts, by weight, of a copolymer of an aromatic vinyl compound, an α,β-unsaturated mono- and/or di-carboxylic acid or an anhydride thereof, free acid groups optionally being neutralised by a mono- and/or poly-amine or with ammonia, and an ester of the said mono- and or di-carboxylic acid;

the total of components (1), (2) and (3) amounting to 100 parts, by weight.

4,100,224

STABLE ORGANIC DISPERSIONS WHICH CAN BE CURED WITH LITTLE SHRINKAGE, BASED ON UNSATURATED POLYESTER RESINS AND THERMOPLASTIC POLYMERS

Bernhard Hess, Moers; Karl Raichle, Krefeld; Ludwig Bottenbruch, Krefeld; Hansjochen Schulz-Walz, Krefeld, and Heinrich Alberts, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 22, 1976, Ser. No. 669,285

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1975, 2513255

Int. Cl.[2] C08L *67/06*

U.S. Cl. 260—862 5 Claims

1. An organic dispersion which consists essentially of:

(A) 20–70% by weight of an α,β-ethylenically unsaturated polyester;

(B) 20–70% by weight of a copolymerizable vinyl or vinylidene compound;

(C) 3–30% by weight of a thermoplastic polymer which is colloidally soluble in component B, incompatible with a composition comprising components A plus B and which consists essentially of polyestyrene, polyacrylic acid ester or polymethacrylic acid ester; and

(D) 0.001–20% by weight of ethylene/vinyl acetate copolymer having a vinyl acetate content of 50–80% by weight and a Mooney viscosity of 8–60 measured according to DIN 53,523 (L-4), said percentages by weight being based on the sum of weights of components A, B and C.

4,100,225

STABLE POLYMER COMPOSITIONS CONTAINING PERFLUOROALKYL GROUPS AND PROCESS FOR MAKING

Karl Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 481,429, Jun. 20, 1974, abandoned, which is a continuation of Ser. No. 355,639, Apr. 30, 1973, abandoned, which is a continuation of Ser. No. 122,131, Mar. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 750,464, Aug. 6, 1968, abandoned. This application Mar. 3, 1976, Ser. No. 663,420

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.[2] C08F *255/06, 279/02, 261/06, 265/06*

U.S. Cl. 260—878 R 12 Claims

1. A process for preparing a composition comprising a backbone polymer having attached to the graft sites thereof perfluoroalkyl ester units with no more than three units attached to any one graft site, which comprises dissolving a backbone polymer having a reactive double bond or a hydrogen atom which can be abstracted by a free radical, a free-radical generating initiator, and a perfluoroalkyl ester of fumaric acid in an organic solvent and reacting the resulting mixture for a period of time in the range of about 0.5 to about 24 hours.

4,100,226

INDENE-CHLOROBUTYL RUBBER COPOLYMERS

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 23, 1976, Ser. No. 753,919

Int. Cl.[2] C08F *279/02*

U.S. Cl. 260—879 9 Claims

1. The graft polymer composition resulting from the polymerization of (A) from 60 to 95% by weight of indene in the presence of from 5 to 40% by weight of (B) a chlorinated rubbery copolymer of from 95% to 99% by weight of isobutylene and from 1 to 5% by weight of isoprene.

4,100,227

TRANSPARENT IMPACT-RESISTANT POLYSTYRENE STRUCTURE

Corwin J. Bredeweg; Kent S. Dennis, and Charles E. Lyons, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 4, 1977, Ser. No. 784,483

Int. Cl.[2] C08F *279/02*

U.S. Cl. 260—880 R 7 Claims

1. A method for the preparation of a generally transparent impact-resistant polymer structure, the steps of the method comprising providing a rubbery reinforcing diene polymer which is a polymer prepared from 1,3-butadiene, isoprene, or mixtures thereof, the diene rubber having an inherent viscosity in the range of 0.9 to 2.5 as determined at 25° C employing 0.3 gram of rubber per deciliter of toluene, the diene rubber being employed in a proportion of from about five to twelve parts by weight, preparing a solution of the diene rubber in styrene and from about 0.01 percent to 0.3 percent by weight based on the combined weight of the rubber and styrene of a bromine-containing compound selected from the group consisting of: allyl bromide, 2-(bromomethyl)-3-bromopropene, 3,3-dibromo-1-propene, 3-bromo-1-pentene; 3,4-dibromo-1-butene, 2-(dibromomethyl)-1-butene, 2-(bromomethyl)-1-butene, 2-(bromomethyl)-1-pentene, 2-(dibromomethyl)-1-pentene, 2-(bromomethyl)-1-hexene, 3-bromo-1-hexene, 2-(dibromomethyl)-1-hexene, 3-bromocyclohexene and 3-bromocyclopentene and mixtures thereof, heating the mixture with agitation to a temperature to initiate free radical polymerization maintaining agitation until at least about 30 weight percent of styrene is converted to polymer and subsequently polymerizing the mixture until about 70 to 90 percent conversion of styrene to polymer to thereby provide an improved styrene polymer structure, the structure comprising a continuous matrix of polystyrene, the structure having a dispersed phase of a reinforcing diene rubber, the diene rubber being present in a proportion of about five to about twelve parts by weight per one-hundred parts by weight of the combined weight of styrene and rubber, the rubber being in the form of a plurality of particles of generally cellular nature and containing occlusions of polystyrene, the particles being of both monocellular and multicellular configuration, the rubber particles having a weight average particle diameter not exceeding two microns and cell walls not greater than about 0.15 microns in thickness, the dimensions and configuration of the rubber particles being determined by means of an electron microscope on a sample of the polymer which has been treated with osmium tetroxide in accordance with the procedure set forth in *Polymer Engineering and Science*, by K. Kato, 7, 38(1967), with the further limitation that when the structure has a thickness of about 10 mils, the light absorbance, being measured using a wave length of 640 millimicrons, is not greater than about 0.10, and the structure has a notched izod impact value when measured in accordance with the American Society for Testing Materials, Specification D 256A of at least 0.65 foot pounds per inch of notch.

4,100,228

TRANSPARENT IMPACT STYRENE POLYMER STRUCTURE

Kent S. Dennis; Charles E. Lyons, and Corwin J. Bredeweg, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 4, 1977, Ser. No. 784,482

Int. Cl.[2] C08F *279/06*

U.S. Cl. 260—880 R 8 Claims

1. A method for the preparation of a generally transparent impact resistant polymer structure, the steps of the method comprising providing a rubbery reinforcing diene polymer which is a polymer prepared from 1,3-butadiene, isoprene or mixtures thereof, the diene rubber having an inherent viscosity in the range of 0.9–2.5 as determined at 25° C employing 0.3 gram of rubber per deciliter of toluene, the diene rubber being

employed in a proportion of from about 4 to 12 parts by weight, preparing a solution of the diene rubber in a mixture of (a) styrene and methylmethacrylate, the styrene being present in a proportion from about 65 to 95 parts by weight and the methylmethacrylate being present in a proportion from about 5 to 35 parts by weight of methylmethacrylate, (b) from about 0.01 to 0.5 weight percent of a bromine-containing compound selected from the group consisting of: allyl bromide, 2-(bromomethyl)-3-bromopropene, 3,3-dibromo-1-propene, 1-bromo-1-propene, 1-bromo-1-butene, 1-bromo-1-pentene 1-bromo-1-hexene 3-bromo-1-pentene, 3,4-dibromo-1-butene, 2-(dibromomethyl)-1-pentene, 2-(bromomethyl)-1-butene, 2-(bromomethyl)-1-pentene, 2-(dibormomethyl)-1-pentene, 2-(bromomethyl)-1-hexane, 3-bromo-1-hexene, 2-(dibromomethyl)-1-hexene, 3-bromocyclohexene, and 3-bromocyclopentene, and mixtures of such compounds, heating the mixture with agitation to a temperature to initiate free radical polymerization, maintaining agitation until at least about 30 weight percent of the combined weight of the styrene and methylmethacrylate is converted to polymer and subsequently polymerizing the mixture until about 70 to 95 percent conversion of monomer to polymer to thereby provide in an improved synthetic resinous structure or body, the structure comprising a continuous matrix of a polymer of about 65 to 95 parts by weight of styrene and 5 to 35 parts by weight of methylmethacrylate, the structure having a dispersed phase of a diene rubber, the diene rubber being present in a proportion of from 4 to about 12 parts by weight per hundred parts by weight of the combined weight of styrene and methylmethacrylate, the rubber being in the form of a plurality of particles dispersed throughout a styrene-methylmethacrylate polymer continuous phase, the rubber particles being of a generally cellular nature and containing occulusions of the styrene-methylmethacrylate polymer, the particles being of both monocellular and multicellular configurations, the rubber particles having a weight average particle diameter not exceeding 2 microns and the cell walls of the rubber particles having a thickness not exceeding 0.15 microns, the dimensions and configuration of the rubber particles being determined by means of an electron microscope on a sample of the polymer which has been treated with osmium tetraoxide, [K. Kato, *Polymer Engineering and Science,* 7, 38(1967)], with the further limitation that when the structure has a thickness of about 10 mils, the light absorbance, as measured using a wavelength of 640 millimicrons, is not greater than about 0.07, and the structure has a notched Izod impact value, when measured in accordance with The American Society for Testing Materials Specification D256A, of at least 0.65 foot pounds per inch of notch.

4,100,229

LOW PROFILE ADDITIVES IN POLYESTER SYSTEMS

Willis T. Schwartz, Jr., Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Division of Ser. No. 665,751, Mar. 11, 1976, Pat. No. 4,038,341. This application May 2, 1977, Ser. No. 793,221

Int. Cl.[2] C08L *47/00, 67/06;* C08F *218/14;* C08G *81/00*

U.S. Cl. 260—887 **3 Claims**

1. A low profile additive for polyester molding compositions comprising the reaction product of a styrene-maleic anhydride copolymer and a hydroxyl-terminated polydiene.

4,100,230

PROCESS FOR PREPARING MONO- AND DISUBSTITUTED MERCAPTO-PHOSPHOROTHIONOCHLORIDATES

Eugene H. Uhing, Pleasantville, N.Y., and Arthur D. F. Toy, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 4, 1976, Ser. No. 711,769

Int. Cl.[2] C07F *9/20*

U.S. Cl. 260—972 **14 Claims**

1. A process for preparing a compound having the formula:

$$(RS)_xP(S)Cl_{(3-x)}$$

where each R is an independently selected alkyl, cycloalkyl or benzyl, and x is 1 or 2, comprising; reacting a sulfide reactant having the formula R_2S wherein R is as defined above, with P_4S_{10} and $P(S)Cl_3$ at a temperature of from about 150° C to about 300° C, and recovering the $(RS)_xP(S)Cl_{(3-x)}$.

4,100,231

PROCESS FOR MAKING PHOSPHATE ESTERS AND PRODUCTS THEREOF

Wun Ten Tai, Palos Hills; Lawrence A. Mura, Oak Forest; Kenneth G. Phillips, River Forest, and Edward G. Ballweber, Glenwood, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 632,066, Nov. 14, 1975, Pat. No. 4,061,695. This application Mar. 1, 1977, Ser. No. 773,176

Int. Cl.[2] C07C *9/09*

U.S. Cl. 260—978 **12 Claims**

1. A process for making an organophosphate composition comprising simultaneously

(A) heating for a time not greater than about 2 hours in a reaction zone at a temperature of from about 135 to 165° C at least one phosphoric acid material selected from the group consisting of phosphoric acid and polyphosphoric acid in admixture with a least one polyol which is characterized by

(1) having from 2 to 7 carbon atoms per molecule,

(2) having from 2 to 4 hydroxyl groups per molecule distributed so that not more than one oxygen atom is substituted on each carbon atom per molecule, and

(3) being selected from the group consisting of hydroxyl substituted saturated aliphatic hydrocarbons,

in the presence of at least one inorganic base selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, and ammonia, the mole ratio of said polyol to said phosphoric acid material as charged to said zone ranging from about 0.56 to 0.77 and the mole ratio of said inorganic base to said phosphoric acid material ranging from about 0.25 to 0.75 while maintaining said reaction zone at a subatmospheric pressure ranging from greater than 0 to about 400 mm Hg, and while removing water from said zone at a rate at least about equal to the rate water is generated in said reaction zone,

(B) cooling the resulting reaction product to a temperature in the range from about 60° to 130° C., said reaction product comprising on a 100 weight percent total weight basis

(a) from 0 to about 15 weight percent inorganic phosphate,

(b) the balance up to 100 weight percent of any given said reaction product being organophosphate material, and

(c) said organophosphate material containing on a 100 weight percent total organophosphate weight basis from about 20 to 60 weight percent of phosphate ester polymer material,

(C) admixing the resulting so cooled reaction product with, and dissolving same in sufficient water to form a product solution comprised on a 100 weight percent total weight basis of from about 5 to 70 weight percent water with the balance up to 100 weight percent thereof being said reaction product.

4,100,232

CARBURETORS

Ronald Swynerton Kaye, 112 Kunyung Rd., Mt. Eliza, Victoria, 3930, Australia

Continuation of Ser. No. 645,994, Jan. 2, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,864

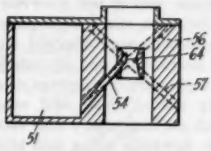
Int. Cl.[2] F02M *5/12*

U.S. Cl. 261—36 A **15 Claims**

1. A fuel regulating device for a carburetor having a float chamber for receiving fuel and a throat, said float chamber

lying to one side of the throat in an imaginary vertical plane extending through said carburetor, a throat passage connected to said chamber and extending between the chamber and the throat and lying in said imaginary vertical plane, said passage having a nozzle for discharging fuel into the air stream passing through the throat, said chamber having a float for establishing fuel levels in said chamber and passage, said fuel regulating device being operative to prevent a discharge of fuel from said throat nozzle responsive to tilting to the carburettor in said imaginary vertical plane about an axis normal thereto which increases the fuel level in the throat passage, said fuel regulating device comprising:

a duct coupled to said carburettor and lying in a second



imaginary vertical plane parallel to said first imaginary plane, said duct having an inlet end, an outlet end, and an intermediate portion; said inlet end communicating with the float chamber; said outlet end forming a fuel discharge means for said duct; said intermediate portion forming a weir which is aligned with the nozzle of the throat passage in a direction normal to the vertical planes, the flow controlling portion of said weir being positioned below the opening of the nozzle for being responsive to increases in the level of fuel in the passage resulting from tilting the carburetor about said normal axis to pass fuel from said inlet end to said outlet end of said duct at an increased level of fuel in the throat passage less than that which causes a discharge of fuel from the throat nozzle.

4,100,233

SILICON CARBIDE FIBERS HAVING A HIGH STRENGTH AND A METHOD FOR PRODUCING SAID FIBERS

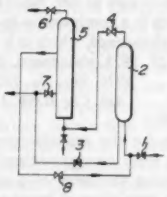
Seishi Yajima; Josaburo Hayashi, and Mamoru Omori, all of Oharai, Japan, assignors to The Research Institute for Iron, Steel and other Metals of the Tohoku University, Sendai, Japan

Filed Apr. 19, 1976, Ser. No. 677,960

Claims priority, application Japan, Apr. 25, 1975, 50-50529; May 2, 1975, 50-52471; May 2, 1975, 50-52472; May 16, 1975, 50-58033; May 16, 1975, 50-58034; Jun. 11, 1975, 50-70302; Jun. 11, 1975, 50-70303; Jun. 23, 1975, 50-77219; Jun. 30, 1975, 50-79972; Sep. 4, 1975, 50-107371

Int. Cl.² C01B *31/36*

U.S. Cl. 423—345 **44 Claims**



32. A method for producing silicon carbide fibers having a high tensile strength which comprises

(1) preparing a spinning solution from at least one organosilicon high molecular weight compound having a softening point of higher than 50° C, in which silicon and carbon are the main skeleton components, and spinning said spinning solution into fibers,

(2) preliminarily heating the spun fibers at a temperature of 350°–800° C under vacuum to volatilize low molecular weight compounds contained therein, and

(3) baking the thus treated fibers at a temperature of 800°–2,000° C under vacuum or at least one nonoxidizing atmosphere selected from the group consisting of an inert gas, CO gas and hydrogen gas, to form said silicon carbide fibers.

39. A method for producing silicon carbide fibers having a high tensile strength which comprises:

(1) subjecting polysilanes having Si-Si bond which have no halogen atoms to polycondensation reaction by at least one process of addition of a polycondensation catalyst, irradiation and heating to produce polycarbosilanes containing no halogen atoms,

(2) reducing a content of low molecular weight compounds contained in said polycarbosilanes by treating the above described polycarbosilanes with at least one treatment of a solvent, aging said polycarbosilanes at a temperature of 50°–700° C and distilling said polycarbosilanes at a temperature of 100°– 500° C, to produce the polycarbosilanes having a softening point of higher than 50° C,

(3) dissolving the thus treated polycarbosilanes in a solvent or melting said polycarbosilanes to prepare spinning solution or spinning melt, and spinning said spinning solution or spinning melt into filaments,

(4) baking the thus treated filaments at a temperature of 800°– 2,000° C, under vacuum or at least one non-oxidizing atmosphere selected from the group consisting of an inert gas, CO gas and hydrogen gas to form silicon carbide fibers.

44. Continuous silicon carbide fibers having tensile strength of 200–800 Kg/mm², Young's modulus of 10–40 ton/mm² and resistant to corrosion and oxidation and showing no decrease in the tensile strength and Young's modulus at a high temperature of higher than 800° C, which are composed of ultra-fine grain silicon carbide having an average grain size of less than 0.1 μ.

4,100,234

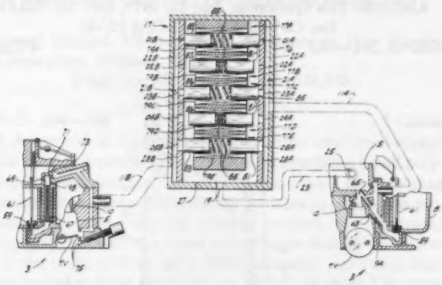
AIR METERING APPARATUS

Allen W. Lindberg, Kirkwood, and Thomas R. Gantzert, Florissant, both of Mo., assignors to ACF Industries, Inc., New York, N.Y.

Filed Feb. 11, 1977, Ser. No. 768,007

Int. Cl.² F02M *7/24*

U.S. Cl. 261—121 B **11 Claims**



1. Apparatus for metering the quantity of air supplied to at least two fuel systems in a carburetor for an internal combustion engine, said carburetor having at least one air passageway therein through which air is drawn into the engine, fuel from a source thereof being supplied to said carburetor through said fuel systems and mixed with air as it passes through the carburetor and the carburetor having a first conduit through which air is introduced into a first of said fuel systems and a second

conduit through which air is supplied to the second of said fuel systems, the apparatus comprising:

a chamber having an air inlet in communication with said air passageway and a first set of air outlets in communication with said first conduit and a second set of air outlets in communication with said second conduit, each set of air outlets comprising a plurality thereof with the same number of air outlets being in each set and with each of the air outlets in said second set being substantially equal in size to a corresponding one of the air outlets in said first set and said chamber comprising a housing having first and second partitions dividing it into an inlet chamber between a first and a second output chamber, said air inlet being in communication with said inlet chamber, said first conduit being in communication with said first outlet chamber and said second conduit being in communication with said second outlet chamber, said first set of air outlets being in said first partition and said second set of air outlets being in said second partition;

electrically operated valve means for selectively opening and closing each air outlet in each set, the valve means of each air outlet of said first set and the valve means of the corresponding air outlet of said second set being conjointly operable for opening an air outlet of said second set simultaneously with the opening of the corresponding air outlet of said first set and said valve means including a single set of windings in said inlet chamber for each of the corresponding air outlets in the two sets and a valve member for each air outlet of said first set and a valve member for each air outlet of said second set, the valve members for corresponding air outlets in the two sets being operated by one of the windings when it is energized;

means biasing each valve member for an air outlet of said first set and each valve member for an air outlet of said second set toward its closed position closing its associated air outlet; and

means for selectively supplying electrical current to each of said windings of said valve means whereby one or more of the corresponding air outlets in said first and second sets are simultaneously opened thereby to supply air from said passageway to said first and second conduits to control the quantity of air flowing to said first and second fuel systems.

4,100,235

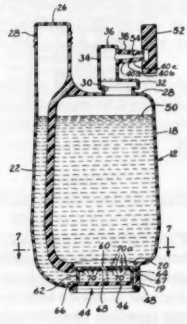
HUMIDIFIER-NEBULIZER APPARATUS

Everett D. Thornwald, Glenview, Ill., assignor to Aerwey Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 569,229, Apr. 18, 1975, Pat. No. 4,061,698. This application Jan. 31, 1977, Ser. No. 763,818

Int. Cl.[2] B01F *3/04*; A61M *15/00*

U.S. Cl. 261—142 **4 Claims**



1. A liquid reservoir for use in containing a liquid such as sterilized water preparatory to mixing the liquid with a gas in a nebulizer or humidifier system, said reservoir including a primary liquid reservoir adapted to contain a quantity of liquid and having a humidifier discharge passage communicating with the interior of said primary reservoir, said primary reservoir having an opening at its lower end defined by a generally annular wall, sparger means supported by said reservoir and including a liquid impervious bottom wall sealingly secured at its periphery to said annular wall within said reservoir opening so as to close said opening at the lower end thereof, said sparger means further including a sparger plate spaced from said bottom wall and sealingly secured at its periphery to said annular wall so as to extend across said opening adjacent the upper end thereof, said sparger plate having an annular depending wall formed thereon the lower edge of which abuts said bottom wall, said depending wall being spaced inwardly from said annular wall of said reservoir to define an annular passage therebetween, said sparger plate having a plurality of flow orifices therethrough disposed within the area of said sparger plate interiorly of said depending wall, said depending wall having a plurality of openings therein equidistantly circumferentially spaced about said annular depending wall through which gas may pass, a filler tube extending generally longitudinally upwardly along said primary reservoir externally thereof and having a lower end connected to said annular wall such that the interior of said filler tube is in communication with said annular passage such that gas caused to pass downwardly within said filler tube passes through said openings in said depending wall and through said flow orifices in said sparger plate for dispersion through any liquid contained within said primary liquid reservoir.

4,100,236

METHOD OF PREPARING MICRON SIZE PARTICLES OF SOLID POLYMERS

Gerald A. Gordon, Skokie, and Karl Josephy, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Nov. 16, 1976, Ser. No. 742,402

Int. Cl.[2] B01J *2/06*

U.S. Cl. 264—8 **10 Claims**

1. A method of preparing micron sized polymer particles which comprises preparing a homogeneous solution of the polymer in a normally liquid organic material which is a solvent for the polymer, the concentration of the polymer in the solvent being in the range of about 0.1 to 50 grams/liter of solvent, atomizing the solution, impinging the atomized solution into a moving film of liquid which is a nonsolvent for the polymer, and then recovering a dispersion of precipitated micron sized particles in the mixture of organic solvent and nonsolvent.

4,100,237

CO-EXTRUSION OF ABS/POLYSTYRENE MULTIPLE-LAYERED SHEETING

Donald F. Wiley, Tempe, Ariz., assignor to Cosden Technology, Inc., Big Spring, Tex.

Continuation-in-part of Ser. No. 519,682, Oct. 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 368,834, Jun. 11, 1973, abandoned, which is a continuation of Ser. No. 128,940, Mar. 29, 1971, abandoned. This application Dec. 20, 1976, Ser. No. 752,619

Int. Cl.[2] B29F *3/10*

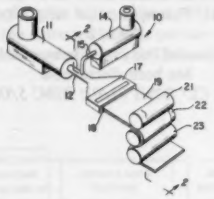
U.S. Cl. 264—40.6 **10 Claims**

1. A process for the manufacture of composite sheeting having a major layer corresponding substantially to the final composite sheeting thickness of a styrene polymer selected from the group consisting of homopolystyrene, impact polystyrene and normal copolymers of styrene containing a minor amount of another copolymerizable monomer, and a minor layer constituting less than 20% of the total final thickness of an ABS polymer firmly united to the exterior surface of said major layer, comprising conveying a heat plasticized stream of said styrene polymer in a conduit, joining to the exterior sur-

face of said styrene polymer stream within the said conduit a second, heat plasticized stream of said ABS polymer, said ABS polymer being characterized by a bonding factor (BF_c) of between about 0.9 and 1.15, wherein said bonding factor is defined as

$$BF_c = [A(15.4) + B(8.6) + S(9.1)]\delta_S$$

wherein *A*, *B* and *C* are the respective percentages of acrylonitrile, butadiene and styrene in said ABS polymer, δ_S is the Hildebrand solubility parameter for said styrene polymer and *A* is less than about 0.45, said second stream constituting less than about 20% by volume of the combined first and second streams thereby forming a single stratified stream of heat plasticized material conforming to the cross section of said conduit



and being characterized by distinct, contiguous layers of said polymeric materials having a relatively sharply defined interface therebetween, said interface terminating at each end at a point on the inside surface of said conduit, adjusting the temperature of said stream of ABS to a temperature at which the melt viscosity of the ABS polymer stream exhibits a value within the range of about 50% to 150% of the melt viscosity exhibited by said styrene polymer stream under the conditions of the extrusion process, conveying said composite stream undisturbed through said conduit to a sheet-form extrusion die having its die lips generally aligned in parallel with the said interface between the two polymeric materials, and passing said composite stream of molten material through the said die to form a sheet, whereby said second stream spreads laterally across said first stream inside of said extrusion die thereby forming said minor layer of said composite sheeting.

4,100,238

PROCESS FOR PRODUCING PERMEABLE MEMBRANES

Toshihiko Shinomura, Yokohama, Japan, assignor to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 669,450
Claims priority, application Japan, Mar. 20, 1975, 50-32956
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—49 **4 Claims**

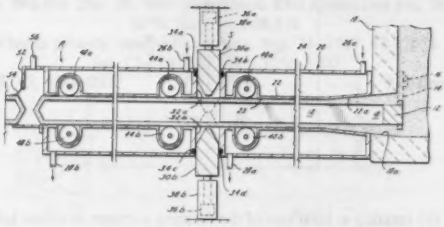
1. A process for producing a permeable membrane, which comprises mixing, in a molten state, (A) 90 to 30 parts by weight of at least one thermoplastic linear organic synthetic resin having stretchability with (B) 10 to 70 parts by weight of at least one compound having partial compatibility with the synthetic resin (A) and selected from the group consisting of synthetic polymers or oligomers containing at least 20 carbon atoms, natural organic polymeric compounds containing at least 20 carbon atoms, fatty acids containing at least 16 carbon atoms, and esters or salts of said fatty acids, the total amount of components (A) and (B) being 100 parts by weight; fabricating the resultant molten mixture into a film or sheet in which components (A) and (B) are present in a partly mutually dissolved state; treating said film or sheet with a solvent which is a good solvent for component (B) but a poor solvent for component (A), for a time sufficient to remove 50 to 100% by weight of component (B) from said film or sheet; drying the thus treated film or sheet until the amount of said solvent in or adhering to said film or sheet is not more than 10% by weight based on the total weight of said solvent and said film or sheet; and stretching the dried film or sheet 50 to 1500% monoaxially or biaxially to form a network of continuous pores in the film or sheet.

4,100,239

METHOD FOR MAKING HOLLOW PANELS

Lonnie E. Daniels, Jr., 1014 W. 18th St., Houston, Tex. 77008

Filed May 23, 1977, Ser. No. 799,261
Int. Cl.[2] B29D *23/03, 23/04;* B29G *2/00*
U.S. Cl. 264—102 **4 Claims**



1. A process for continuously molding a hollow insulation product from plastic material having the resulting central cavity at a vacuum pressure condition including the steps of:

processing the plastic material into a flowable form;

placing the flowable plastic material continuously about a core to form an enclosed continuous central cavity in the plastic material while forming the outer predetermined dimensions of the insulation product;

hardening and cooling the plastic material sufficiently to maintain the outer predetermined dimensions;

forming a vacuum about the plastic material to maintain the area adjacent the outer predetermined dimension below atmospheric pressure;

severing the continuous plastic material periodically to form end closures for the severed plastic material;

sealing the central cavity of the severed plastic material with the end flaps to form the hollow insulation product with the sealed central cavity having a pressure therein below atmospheric pressure;

hardening and cooling the sealed hollow insulation product to retain the predetermined shape;

moving the sealed hollow insulation product out of the vacuum.

4,100,240

LIQUID POLYMER EXTRUSION PROCESS AND PRODUCT

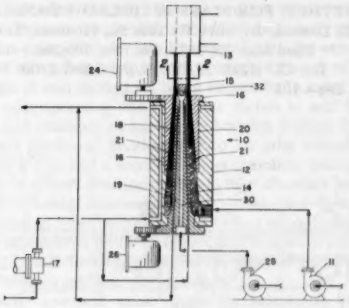
Giovanni Bassani, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 30, 1976, Ser. No. 728,328
Int. Cl.[2] B29D *23/05*
U.S. Cl. 264—108 **2 Claims**

1. A method of forming an oriented-fiber reinforced elastomeric tubular product by continuously extruding a liquid polymer precursor, said method employing a heated non-pumping extruder having rotatable forming surfaces to shape the precursor as it cures into said tubular product, said precursor being characterized by a room temperature Brookfield viscosity in the range of from 20 to 4000 centipoise and a cure time when heated to from about 150° to 250° C. of about 3 to about ½ seconds and wherein said non-pumping extruder the fibers are oriented to both provide increased strength to the tubular product and to facilitate said method by adding strength to the semi-cured extrudate as it emerges from said non-pumping extruder; said method comprising the steps of:

(a) pumping said fiber containing liquid polymer precursor through said non-pumping extruder which is heated to initiate the curing reaction said precursor having a resi-

dence time in said extruder such that as the curing precursor emerges from the die it has reached a substantially self-sustaining state; and simultaneously



(b) rotating at least one of the forming surfaces to orient said fibers; and

(c) heating the semi-cured extrudate to drive the curing reaction toward completion.

4,100,241

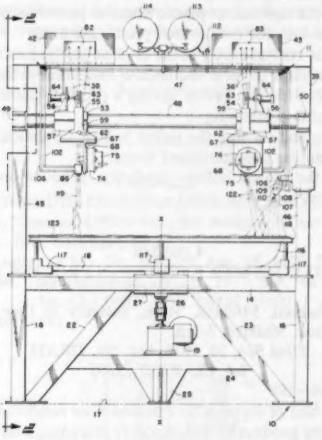
METHOD FOR MANUFACTURING CURVED BODIES OF FIBER REINFORCED PLASTIC

William J. Hampshire, Peninsula, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 611,978, Sep. 10, 1975, Pat. No. 3,988,089. This application Jul. 14, 1976, Ser. No. 705,062

Int. Cl.² D04H *3/16*

U.S. Cl. 264—113 **14 Claims**



1. A method of building a preform for a curved fiber reinforced body of plastic material in which said body is curved about an axis of revolution having a radius of curvature comprising:

(a) depositing a stream of radial fibers on a support rotating about a generally vertical axis at a first position over said support in a direction generally along the radii of curvature of said curved body,

(b) depositing a stream of circumferential fibers on said support rotating about said axis at a second position over said support in a direction generally tangential to an arc of said body,

(c) spraying a liquid plastic material onto said fibers during steps (a) and (b) so that successive layers of said fibers coated with said liquid plastic material are built up during successive revolutions of said support during rotation until a preform of desired thickness is laid down on said support, and

(d) removing said preform from said support.

4,100,242

METHOD OF MOLDING AQUEOUS SETTABLE SLURRIES CONTAINING SHREDDED OPEN-CELL POLYSTYRENE PARTICLES

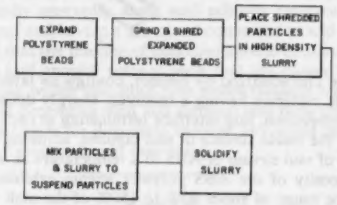
Irby H. Leach, 2094 Emerson, Napa, Calif. 94558

Continuation-in-part of Ser. No. 118,569, Feb. 24, 1971, abandoned, which is a division of Ser. No. 844,895, Jul. 25, 1969, Pat. No. 3,630,820, and Ser. No. 118,483, Feb. 24, 1971, Pat. No. 3,686,068, which is a division of Ser. No. 844,896, Jul. 25, 1969, Pat. No. 3,627,211. This application Aug. 10, 1972, Ser. No. 279,422

The portion of the term of this patent subsequent to Jun. 5, 1990, has been disclaimed.

Int. Cl.² B28B *21/02*; B28C *5/00*

U.S. Cl. 264—115 **6 Claims**


EXPAND POLYSTYRENE BEADS
GRIND & SHRED EXPANDED POLYSTYRENE BEADS
PLACE SHREDDED PARTICLES IN HIGH DENSITY SLURRY
MIX PARTICLES & SLURRY TO SUSPEND PARTICLES
SOLIDIFY SLURRY

1. A method for forming a lightweight granular structure comprising forming a slurried mixture of high viscosity including as the essential slurry constituents, water, relatively low density foam particles having a large surface area compared to volume caused by tears and serrations which provide ragged ridges and intersect a substantial number of foam cells opening the foam cells to the exterior and a material chosen from the group consisting of cement and gypsum, bringing about the penetration of the foam particles by said material and said water and distributing the particles substantially uniformly throughout the slurried mixture, thereafter forming said structure by positioning the slurry so that it has a vertical extent substantially greater than the largest dimension of the foam particles, and solidifying the mixture while maintaining the slurry still with said particles distributed substantially uniformly throughout said mixture.

4,100,243

PROCESS FOR THE SIZING OF COEXTRUDED, MULTIPLE-LAYER EXTRUDED PROFILES FROM THERMOPLASTIC SYNTHETIC RESINS

Waldemar Wissinger, Siegburg, and Peter Gauchel, Alzenbach, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 4, 1976, Ser. No. 711,645

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535286

Int. Cl.² B29F *3/08*

U.S. Cl. 264—171 **12 Claims**

1. A process for the sizing of an extruded profile manufac-

tured by coextrusion of a core profile of a thermoplastic synthetic resin and a cover layer provided over a portion of the periphery made of a thermoplastic synthetic resin different from the thermoplastic of the core profile, such that the extruded profile has a peripheral surface that comprises in part the thermoplastic synthetic resin of the core profile and in part the thermoplastic synthetic resin of the cover layer, one of the thermoplastic synthetic resins having a higher Vicat softening temperature than the other, which comprises sizing the extruded, still plastic profile in the external cross-sectional dimensions, and cooling the extruded profile during this sizing step, said cooling being accomplished using differential cooling of different portions of the extruded profile surface, said differential cooling comprising a more gradual cooling of the part of the extruded profile surface comprised of the thermoplastic synthetic resin having the higher Vicat softening temperature than that part of the extruded profile surface comprised of the thermoplastic synthetic resin having the lower Vicat softening temperature.

4,100,244

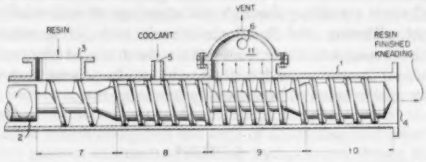
METHOD FOR DIRECTLY COOLING MELTED THERMOPLASTIC RESINS

Hidehiro Nonaka, Hiroshima, Japan, assignor to Japan Steel Works LTD, Japan

Continuation of Ser. No. 336,553, Feb. 28, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,131

Int. Cl.[2] B29F *3/08*

U.S. Cl. 264—211 **6 Claims**



1. Method of cooling melted thermoplastic resin in a continuous extruder having a primary mixing zone and a final mixing zone, which comprises directly injecting a coolant having a lower boiling point than said thermoplastic resin and being inactive to said resin, into the melted thermoplastic resin while mixing the resin in the primary mixing zone of the extruder at a temperature in the range of about 175° C, injecting said coolant at a temperature sufficiently lower than said melted thermoplastic resin and cooling said melted thermoplastic resin to a temperature in the range of about 130° C to 156° C before entrance into the final mixing zone of the extruder; said coolant being injected through a coolant inlet injection orifice formed in the wall of said extruder downstream of the resin inlet and said coolant being injected at a definite weight ratio of about 6.8 to 13.4 percent relative to the extruded thermoplastic resin, said extruder having a coolant vent orifice arranged downstream of said coolant inlet in the primary mixing zone of said extruder, and said extruder further being provided with an external indirect cooling jacket; uniformly mixing said coolant with said thermoplastic resin in said primary mixing zone; and removing said coolant through said coolant vent orifice before mixing the cooled thermoplastic resin in the final mixing zone of the extruder with indirect cooling through said cooling jacket and recovering the cooled mixed resin from said final mixing zone.

4,100,245

METHOD FOR MANUFACTURING BEARINGS OR OTHER ANTI-FRICTION ELEMENTS FORMED OF LUBRICANT CONTAINED POLYACETAL

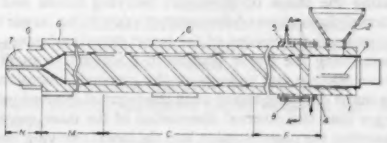
Masayuki Horikawa, Tokyo; Yataro Takata, Yokohama, and Kikuo Sumiyoshi, Tokyo, all of Japan, assignors to Oiles Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 584,506, Jun. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 366,425, Jun. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 36,950, May 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 694,495, Dec. 29, 1967, abandoned. This application Jul. 26, 1976, Ser. No. 708,370

Claims priority, application Japan, Sep. 11, 1967, 42-57874

Int. Cl.[2] D01F *1/02*; C10M *5/00*

U.S. Cl. 264—211 **9 Claims**



1. A method of making bearings or other anti-friction elements characterized by comprising the steps of uniformly mixing at the normal room temperature polyoxymethylene or copolymers of trioxane and ethylene oxide having the bulk factor of 2 – 8 in the starting material, with 2 to 12 wt % of a lubricant which is in a liquid state at normal room temperature or the melting point of the polymer or copolymer to form a molding composition, the lubricant being from the group consisting of a mineral oil and a synthetic lubricant oil which are in a liquid state at the normal room temperature; or from paraffins, a higher fatty acid or a higher fatty acid ester, which are in a solid state at the normal room temperature but in a liquid state at the melting point of the material being processed; and grease which is in a jelly state at the normal room temperature;

and molding the resultant molding composition to form the element by use of a screw type injection or extrusion molding machine, the temperature of the feed section of the cylinder of the machine which has been controlled to that of 40 – 75% of the melting point of the material used, and having the cylinder temperature controlled to about 65° – 120° C in the feed section, about 120° – 190° C in the compression section, and about 170° – 200° C in the metering and the nozzle sections of the cylinder.

4,100,246

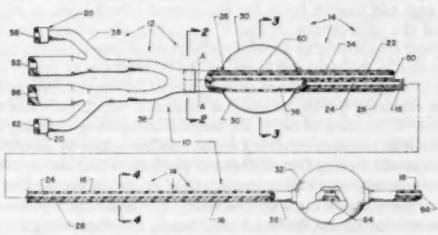
METHOD OF FORMING A GASTROINTESTINAL TUBE

Eldon E. Frisch, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jun. 21, 1976, Ser. No. 698,396

Int. Cl.[2] B29C *13/00*

U.S. Cl. 264—230 **1 Claim**



1. A method of forming an elastomeric four-lumen gastroin-

testinal tube assembly which may be surgically inserted into a patient's stomach and threaded downward into the intestine to provide both intestinal stent plication and gastric and/or intestinal decompression; said assembly having a proximal portion which remains external to the patient's body and a distal portion which is internal to the patient's body when the tube is properly placed, said method comprising the steps of:

(a) extruding an elastomeric three-lumen sleeve portion which when the assembly is formed and placed in the patient's body extends from the proximal portion into the patient's stomach, and wherein the sleeve portion one of the lumens is an insert carrying lumen;

(b) extruding a elastomeric two-lumen insert portion, which when the assembly is formed and placed in the patient's body extends from the proximal portion through the sleeve portion through the patient's stomach and into the intestine; the external shape of the insert portion approximating the shape of the insert carrying lumen and the external dimensions of the insert portion being larger than the internal dimensions of the insert carrying lumen;

(c) immersing the sleeve portion in a solvent to swell the sleeve portion and to increase the internal dimensions of the insert carrying lumen until the internal dimensions are larger than the external dimensions of the insert portion;

(d) inserting the insert portion into the insert carrying lumen, and

(e) removing the solvent and thereby causing the sleeve portion to shrink and the insert carrying lumen to contract around the insert portion thereby forming a "solvent shrink fit" which securely fixes the insert portion in the insert carrying lumen.

4,100,247

METHOD OF MANUFACTURING A DISC WHEEL

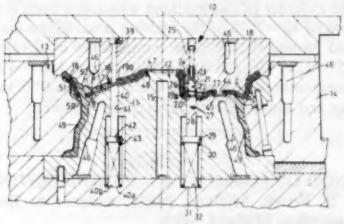
Terence Humphrey Charles Shead, Chorley Wood; Frederick Leslie Hart, Cressage, and Herbert John Sharp, Greenford, all of England, assignors to GKN Sankey Limited, Bilston, England

Filed Mar. 4, 1976, Ser. No. 663,645

Claims priority, application United Kingdom, Mar. 8, 1975, 9753/75

Int. Cl.[2] B29D *3/02;* B29F *1/10*

U.S. Cl. 264—271 **8 Claims**



1. A method of manufacturing a disc wheel which is of generally Y-shape in cross sections radial of the rotary axis of the wheel, the stem of the Y providing the central disc of the wheel and having holes for the normal wheel bolts or studs, and the bifurcations of the Y providing the wheel rim, the wheel comprising an annular metal reinforcement having parts located in the stem and in one of the bifurcations of the Y, and a covering of synthetic resinous material for the reinforcement, the covering having an integral extension which provides the other bifurcation of the Y, the method comprising applying the synthetic resinous covering to the reinforcement by moulding in a mould having first and second portions which are movable towards and away from one another in directions parallel to the rotary axis of the wheel between open and closed positions, the reinforcement having holes therein corresponding to the holes in the finished wheel for said bolts or studs and being located at least at the start of said moulding in a mould cavity defined between said mould portions by first and second series of abutments, each abutment of the first series engaging in one of said holes in the reinforcement and each abutment of the second series engaging the reinforcement at a position radially outwardly of said holes with respect to said rotary axis.

4,100,248

MANUFACTURE OF GRADING AND DEWATERING SCREENS

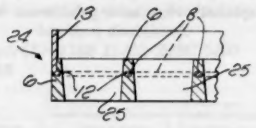
Terence C. Adams, Exeter, England, assignor to Birtley Engineering Limited, Chesterfield, England

Filed Nov. 4, 1976, Ser. No. 738,979

Claims priority, application United Kingdom, Nov. 4, 1975, 45798/75; Jul. 26, 1976, 31105/76

Int. Cl.[2] B29D *3/02;* B29H *7/22*

U.S. Cl. 264—273 **18 Claims**



1. A method of making a reinforced elastomeric apertured screen element for a grading or dewatering screen, comprising the steps of providing a tray-like mould having a substantially horizontal bottom and upright side walls, forming in said mould a sheet of a wear resistant elastomeric material in a liquid state, providing above said mould both a plurality of studs for forming the apertures of the screen element and a substantially rigid open-work reinforcement defining a plurality of openings therein, lowering said reinforcement into contact with said liquid elastomeric material in said mould, lowering said studs whereby said studs penetrate said liquid elastomeric material substantially to said bottom of said mould, said studs extending through said openings of said reinforcement, allowing said liquid elastomeric material to set, and withdrawing said studs from the set sheet of said elastomeric material in said mould leaving said reinforcement and said elastomeric material permanently fixed together.

4,100,249

METHOD OF AND APPARATUS FOR MOLDING A RECEPTACLE

Jacques Pierre Max Giron, Saint Nizier sous Charlieu, France, assignor to Scolarma, Charlieu, France

Filed Nov. 26, 1976, Ser. No. 745,173

Claims priority, application France, Nov. 28, 1975, 75 36456

Int. Cl.[2] B29C *1/12, 1/16;* B28B *7/30;* B22C *9/24*

U.S. Cl. 264—313 **10 Claims**

1. A method of molding comprising the steps of:

(a) juxtaposing a pair of mold parts to form a mold cavity having a relatively large maximum cross-sectional size and having an upper opening and a lower opening of relatively

small cross-sectional size forming a neck portion of the mold separated from said cavity by a shoulder;

(b) positioning in said cavity a hollow core having a body of cross-sectional size greater than that of said lower opening and having a shoulder dimensioned to fit snugly against the shoulder adjacent said neck portion of the mold, a neck extending out of said cavity through said lower opening and adapted to fit snugly within said neck portion of the mold and a laterally extending portion provided at the lower end of the neck of the core adapted to abut against the lower end of the neck portion of the mold when the latter receives the core, said hollow core having an outer elastically inwardly deflectable surface of predetermined shape;

(c) introducing a mass of hardenable material into said cavity from said upper opening of the mold around said core substantially without elastic deformation of the latter;

(d) hardening the introduced mass;

(e) temporarily elastically deforming said core and simultaneously withdrawing the same from the hardened mass; and

(f) displacing said mold parts apart to demold the hardened mass and automatically elastically returning said outer surface to said predetermined shape.

4,100,250
SELECTIVE PRECIPITATION OF COPPER CHLORIDES FROM AQUEOUS SOLUTIONS WITH UNSATURATED ALIPHATIC HYDROCARBONS

Godefridus M. Swinkels, Rossland, Canada, assignor to Cominco Ltd., Vancouver and Sherritt Gordon Mines Limited, Toronto, both of, Canada

Filed Aug. 23, 1976, Ser. No. 716,412
Claims priority, application Canada, Aug. 25, 1975, 234318
Int. Cl.² C01G *3/04*
U.S. Cl. 423—34 **11 Claims**

8. In a hydrometallurgical process for the recovery of copper from copper bearing materials by treating such materials with chloride containing lixiviant whereby solution is obtained containing cuprous chloride, cupric chloride and silver chloride as well as one or more chlorides of metals chosen from the group consisting of iron, zinc, calcium, magnesium and cobalt, the improvement of selectively recovering substantially pure cuprous chloride from said solution in the presence of silver chloride which comprises the steps of contacting said solution with a gaseous unsaturated aliphatic hydrocarbon chosen from the group consisting of straight chain aliphatic hydrocarbons having from 2 to 6 carbon atoms and cyclo aliphatic hydrocarbons having from 4 to 6 carbon atoms to precipitate hydrocarbon cuprous chloride addition compound at a temperature in the range of about −35° to +40° C, maintaining the concentration of cuprous copper in the solution above about 20 g/l whereby the silver chloride remains substantially in solution, separating the addition compound from residual solution, decomposing said addition compound for removal of the hydrocarbon at a temperature in the range of about 40° to 80° C, recycling said removed hydrocarbon to the contacting step and recovering substantially pure cuprous chloride, said process steps being carried out substantially in the absence of an oxygen bearing gas.

4,100,251
METHOD OF RECOVERING METALS OUT OF SOOT ORIGINATING FROM THE COMBUSTION OF OIL

Nils Reinhardt; Ulf Vilhelm Kuylenstierna, both of V:a Frölunda, and Bengt Agne Alfredsson, Stenungsund, all of Sweden, assignors to Sotex AB, Molndal, Sweden

Filed Apr. 7, 1977, Ser. No. 785,536
Claims priority, application Sweden, Apr. 20, 1976, 7604527
Int. Cl.² C01G *49/00, 53/00, 31/00*
U.S. Cl. 423—63 **6 Claims**

1. A process for recovering at least one metal selected from the group consisting of iron, nickel and vanadium which is contained in the soot which results from the combustion of oil, comprising (a) leaching the soot with an aqueous solution of sulphuric acid at a pH of from about 1 to about 2, to extract some of the total metal content from the soot, (b) combusting the leached soot in a furnace at a temperature of from about 600° to about 1200° C, and (c) further leaching the combustion residue with an aqueous solution of sulphuric acid at a pH of from about 0 to about 2, so as to extract more of the metal from the soot and (d) recovering said metal from the leaching solution.

6. The process of claim 1 wherein the metal is recovered from the leaching solution by means of a liquid-liquid extraction.

4,100,252
METAL EXTRACTION PROCESS

Frank Pitts, Madrid, Spain, assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Mar. 28, 1977, Ser. No. 781,753
Claims priority, application United Kingdom, Apr. 26, 1976, 16846/76
Int. Cl.² C01G *31/00*
U.S. Cl. 423—68 **10 Claims**

1. A method for recovering vanadium from a waste vanadiferous residue resulting from the chlorination of a titaniferous ore or ore concentrate in the presence of carbon followed by distillation of titanium tetrachloride, resulting in a fuming residue solid, said fuming solid residue comprising vanadium chloride together with at least one chloride selected from the group consisting of niobium, tantalum, zirconium, titanium and mixtures thereof, at least one chloride selected from the group consisting of aluminum, iron, chromium and manganese, carbon and unreacted ore, said fuming solid residue having been moistened with a small amount of water to form a free-flowing nonfuming powder, which recovery method comprises: forming said moistened solid residue into a slurry with a material selected from the group consisting of water and aqueous sulfuric acid that is between 0.05 and 1 Normal, maintaining said slurry at elevated temperature for a time sufficient to extract substantially all of the vanadium into solution and separating said solution from the remainder which is an insoluble residue comprising carbon, unreacted titaniferous ore and substantially all of the niobium, tantalum, zirconium or titanium.

4,100,253
RECOVERY OF SODIUM AND ANTIMONY VALUES FROM SPENT ETHYLENE GLYCOL RESIDUES

Steve John Dougherty, and Kenneth Joseph Garska, both of Saint Albans, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 25, 1976, Ser. No. 699,977
Int. Cl.² C01B *29/02*
U.S. Cl. 423—87 **5 Claims**

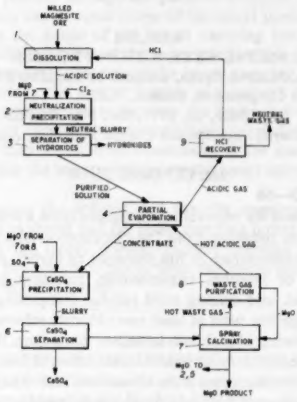
1. A process for recovering antimony and sodium compounds from antimony-containing spent ethylene glycol residues resulting from the manufacture of polyethyleneterephthalate polyester which comprises combusting the spent glycol residues with an oxygen-containing gas so as to produce an ash; contacting said ash with water to effect at least a partial separation of the water-soluble sodium compounds from the relatively insoluble antimony compounds thereby forming an ash-water mixture having a liquid phase and a solid phase, the water-soluble sodium compounds being essentially contained in said liquid phase and the water-insoluble antimony compounds being essentially contained in said solid phase; and separating said liquid phase from said solid phase to recover sodium and antimony compounds from said liquid phase and said solid phase, respectively.

4,100,254

INDUSTRIAL PROCESS OF PREPARING MAGNESIA OF HIGH PURITY

Helmut Grohmann, St. Jakob bei Mixnitz, and Michael Grill, Leoben, both of Austria, assignors to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria

Filed Nov. 18, 1976, Ser. No. 743,072
Claims priority, application Austria, Nov. 20, 1975, 8837/75
Int. Cl.[2] C01F 5/06
U.S. Cl. 423—163 10 Claims



1. In an industrial process of preparing magnesia of high purity from a magnesium-containing starting material containing impurities which comprises

(a) dissolving the starting material in aqueous hydrochloric acid to produce an acidic solution of the starting material, and

(b) subjecting the acidic solution of the starting material to a multi-step treatment wherein the impurities are precipitated from the solution and the precipitate is separated from the residual purified solution, said multi-step treatment comprising

(1) a first step in the purification treatment including precipitating impurities as hydroxides and separating the precipitate from the residual magnesium chloride solution, and

(2) a second treatment step including precipitating calcium present in the magnesium chloride solution by adding sulfate ions containing material and separating the precipitate, said calcium originating from the starting material and/or from material added for promotion of precipitation during the first step of the treatment, and

(c) thermally decomposing the magnesium chloride in the purified solution to obtain magnesia, and recovering the magnesia,

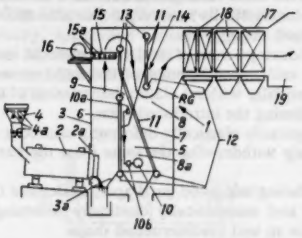
the improvement of first concentrating the magnesium chloride solution in the second treatment step to a content of more than 350 grams $MgCl_2$/liter and then adding thereto the sulfate ions containing material to precipitate the calcium ions from the concentrated solution as calcium sulfate.

4,100,255

COMBUSTION OF REFUSE CONTAINING CHLORINATED HYDROCARBONS

Walter Tschantre, Zurich, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed May 12, 1975, Ser. No. 576,965
Claims priority, application Switzerland, May 16, 1974, 6749/74
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—210 9 Claims



1. Method for simultaneous combustion of refuse and chlorinated hydrocarbons in a single furnace having

a refuse combustion chamber (3) and a separate incineration cell (5) located within at least a portion of the chamber (3) comprising the steps of

introducing the chlorinated hydrocarbons into the cell (5) separately and apart from refuse; introducing refuse into the chamber (3);

incinerating said separate chlorinated hydrocarbons in said incineration cell (5) and whereby chlorinated hydrocarbon combustion gases will be generated;

combusting the refuse in the chamber (3) at a combustion temperature below that of the chlorinated hydrocarbon incinerating temperature and generating refuse combustion gases at a temperature below that of the chlorinated hydrocarbon combustion gases;

retaining the chlorinated hydrocarbon combustion gases while flowing in said cell (5) for a dwell time period of at least one second, separate from the refuse combustion gases;

then mixing the chlorinated hydrocarbon combustion gases and the cooler refuse combustion gases to cool the chlorinated hydrocarbon combustion gases in the mixture;

and then purifying the cooled mixture of refuse combustion gases and chlorinated hydrocarbon combustion gases.

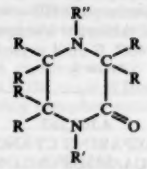
4,100,256

HYDROLYSIS OF CARBON OXYSULFIDE

John W. Bozzelli, Midland; Donald N. Bremer, Freeland, and George D. Shier, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1977, Ser. No. 778,903
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—220 9 Claims

1. A process for hydrolyzing COS to H_2S and CO_2 which comprises contacting a COS-containing gas with an aqueous piperazinone compound solution, said piperazinone compound having the formula



wherein R', R", and each R is independently a hydrogen atom or an alkyl group of 1–5 carbon atoms.

4,100,257

PROCESS AND AMINE-SOLVENT ABSORBENT FOR REMOVING ACIDIC GASES FROM GASEOUS MIXTURES

Guido Sartori, Linden, and David W. Savage, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 14, 1977, Ser. No. 768,420
Int. Cl.² B01D *53/34*
U.S. Cl. 423—226 **20 Claims**

1. A process for the removal of acidic gases from a normally gaseous mixture, which comprises contacting said normally gaseous mixture with an amine-solvent liquid absorbent being comprised of:

(i) an amine mixture comprised of at least 50 mol % of a sterically hindered amine and at least about 10 mol % of a tertiary amino alcohol, wherein said sterically hindered amine contains at least one secondary amino group which is part of a ring and is attached to either a secondary or tertiary carbon atom or a primary amino group attached to a tertiary carbon atom, and

(ii) a solvent for said amine mixture which is a physical absorbent for said acidic gases.

4,100,258

SODIUM ALUMINATE TO REDUCE FLUE GAS CORROSION

Peter H. Vossos, Lisle; Morris Mindick, Downers Grove, and Larry P. Koskan, Orland Park, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 19, 1976, Ser. No. 677,924
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 **8 Claims**

1.

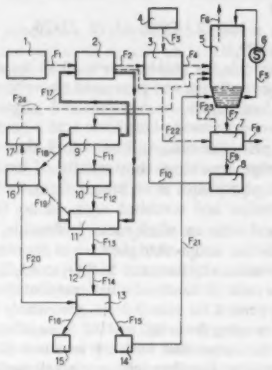
The method of treating flue gas, delivered to a stack, to remove an entrained sulfur-containing compound selected from the group consisting of oxides of sulfur and sulfuric acid derived from burning the fuel, comprising the step of spraying the flue gas, before it reaches the stack, with droplets of an aqueous solution of sodium aluminate ($Na_2O.Al_2O_3$), the ratio of $Na_2O:Al_2O_3$ being greater than 1 to assure a stabilized solution and in which the sodium aluminate used is in an amount effective to remove at least a significant portion of the sulfur-containing compound by virtue of being converted to the sulfates of sodium and aluminum.

4,100,259

PROCESS AND APPARATUS FOR THE PURIFICATION OF FUMES AND GASES AND FOR THE PRODUCTION OF SULFURIC ACID

André Salaün, Saint-Ouen, and René Trempu, Gambais, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Continuation of Ser. No. 491,658, Jul. 25, 1974, abandoned. This application Oct. 21, 1976, Ser. No. 734,526
Claims priority, application France, Jul. 26, 1973, 73 27426; May 14, 1974, 74 16616; Jun. 17, 1974, 74 20910; Jun. 26, 1974, 74 22251
Int. Cl.² C01B *17/00, 17/72*
U.S. Cl. 423—242 **19 Claims**



1. A process for removing sulfur dioxide from a sulfur dioxide-containing gas comprising contacting said sulfur dioxide-containing gas and excess oxygen to oxidize the sulfur dioxide with an aqueous washing medium containing (1) $MnSO_4$, (2) sulfuric acid, and (3) complexes thereof formed in the presence of manganese dioxide, said medium exhibiting a maximum absorption in the visible spectrum at 480 and 500 nanometers, the concentration of sulfate, sulfuric acid, and the complexes in said medium corresponding to a composition obtained by

preparing in an aqueous medium a homogeneous mixture comprising 0.5 to 10 g/l of manganese dioxide monohydrate, 20 to 500 g/l of manganese sulfate monohydrate, and 100 to 1,000 g/l of sulfuric acid,

agitating the resultant composition for at least 30 minutes,

diluting the composition so obtained so that the concentration of manganese sulfate therein is from 10 to 20 g/l and the concentration of sulfuric acid is at least 100 g/l.

4,100,260

REGENERATIVE METHOD FOR QUANTITATIVE REMOVAL OF SULFUR DIOXIDE FROM STACK GASES

Lewis W. Elston, Atlanta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Division of Ser. No. 655,167, Feb. 4, 1976, Pat. No. 4,031,195, which is a continuation-in-part of Ser. No. 359,997, May 14, 1973, abandoned. This application Feb. 22, 1977, Ser. No. 770,669
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 **6 Claims**

1. The method of removing SO_2 from effluent gases, which comprises the steps of:

a. contacting a scrubbing liquid which is an aqueous medium containing essentially I_2, with effluent gases which contain SO_2 for a time sufficient substantially completely to absorb the SO_2 and convert same to H_2SO_4 an HI while maintaining the scrubbing liquid at a pH of 2.0–6.9;

b. reacting the scrubbing liquid containing HI with $CaCO_3$ to produce CaI_2;

c. electrolytically converting the CaI_2 of step (b) to I_2; and
d. recycling the I_2 of step (c) to the contacting region of step (a) thereby to form a closed system.

4,100,261

PRODUCTION OF PURE ALKALI METAL PHOSPHATE SOLUTIONS FROM WET-PROCESSED PHOSPHORIC ACID

Klaus-Peter Ehlers, Erftstadt-Lechenich; Siegfried Lischka, Brühl-Vochem, and Siegfried Burkhardt, Brühl-Kierberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 15, 1975, Ser. No. 640,772

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1974, 2461064

Int. Cl.² C01B *15/16, 25/26*

U.S. Cl. 423—309 **7 Claims**

1. In the process for making pure alkali metal phosphate solutions by neutralizing wet-processed phosphoric acid with alkali metal hydroxides, carbonates and mixtures thereof, wherein the wet-processed phosphoric acid is neutralized so as to establish a pH-value ranging from 4 to 9, the resulting neutralization sludge consisting substantially of insoluble aluminum and iron phosphates is separated from the alkali metal phosphate solution and scrubbed with water, the sludge so treated is mixed with an alkali metal hydroxide, alkali metal phosphate solution and water-glass so as to establish in the resulting suspension a molar ratio of SiO_2 to Al_2O_3 of at least 2 : 1 and a molar ratio of dissolved alkali metal oxide to dissolved P_2O_5 ranging from 2.9 : 1 to 3.3 : 1, the whole is heated to temperatures ranging from 80° to 100° C to effect breakup of the sludge in the suspension with the resultant formation of a solid matter residue together with a trialkali metal phosphate solution, solid matter residue is separated from the trialkali metal phosphate solution, water-scrubbed, and discharged, the improvement which comprises using as starting material crude wet-processed phosphoric acid containing more than 45 weight % of P_2O_5, diluting the acid with the water employed for scrubbing the separated neutralization sludge and thereby reducing the acid's P_2O_5 - content down to 30 to 45 weight %, neutralizing the acid so diluted with alkali metal hydroxides, carbonates and mixtures thereof and with the trialkali metal phosphate solution originating from the processed neutralization sludge, and using the scrubbing water derived by scrubbing the solid matter residue of the breakup of the neutralization sludge as alkali metal solution which is mixed with the water-glass, alkali metal hydroxide and neutralization sludge.

4,100,262

SYNTHESIS OF ZEOLITE ZSM-5

Bruce Patrick Pelrine, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,379

Int. Cl.² C01B *33/28;* C07F *5/06*

U.S. Cl. 423—329 **10 Claims**

1. A method for synthesizing crystalline aluminosilicate zeolite ZSM-5 in a highly twinned, rectangular prismatic crystal form of uniform size which comprises the steps of

preparing a reaction mixture containing sources of sodium oxide, tetraalkylammonium oxide, an oxide of aluminum, an oxide of silicon, water and a tetraureacobalt (II) complex and having a composition, in terms of mole ratios of oxides, falling within the following ranges:

SiO_2/Al_2O_3	=	5–100
H_2O/SiO_2	=	0.7–3000
OH^-/SiO_2	=	0.07–10.0
X/SiO_2	=	0.0047–0.047
M/SiO_2	=	0.3–3.0
R/SiO_2	=	0.01–2.0

wherein M is an alkali metal ion and R is a tetraalkylammonium cation, the alkyl groups of which contain 2–5 carbon atoms and X is a tetraureacobalt (II) complex,

and maintaining said mixture at a temperature of from about 100° F to about 400° F until crystals of said zeolite are formed.

4,100,263

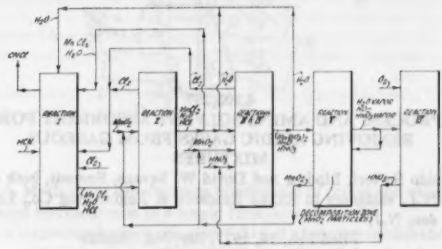
PROCESS FOR PREPARING CYANOGEN CHLORIDE AND GASEOUS CHLORINE

Ralph Miller, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 8, 1976, Ser. No. 748,596

Int. Cl.² C01B *21/18*

U.S. Cl. 423—383 **5 Claims**



4. A process for preparing cyanogen chloride and gaseous chlorine which comprises the steps of reacting hydrogen cyanide and chlorine in an aqueous manganous chloride solution to form cyanogen chloride and hydrogen chloride dissolved in said manganous chloride solution; recovering the cyanogen chloride; reacting, at elevated temperatures, said hydrogen chloride-manganous chloride solution with an amount of solid manganese dioxide exceeding the the 1:4 molar ratio of manganese dioxide to hydrogen chloride to form gaseous chlorine and a residual manganous chloride solution; recovering said gaseous chlorine; reacting said residual manganous chloride solution with solid manganese dioxide and concentrated nitric acid at elevated temperatures to form gaseous chlorine and an acidic manganous nitrate solution; the molar ratio of manganese dioxide to manganous chloride being in excess of 1:1 and the molar ratio of nitric acid to manganous chloride being in excess of 4:1; and recovering said gaseous chlorine.

4,100,264

PROCESS FOR THE PREPARATION OF CALCIUM CARBONATE FOR USE IN FLUORESCENT LAMP PHOSPHORS

Herman R. Heytmeijer, Hanover Township, Morris County; Larry P. Rusch, Edison, and Giuseppe Grasso, Parsippany Troy Hills, all of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 23, 1976, Ser. No. 754,051

Int. Cl.² C01F *11/18*

U.S. Cl. 423—430 **8 Claims**

1. The method of producing finely-divided phosphor grade calcium carbonate having a calcite crystalline structure and a very low sodium content from calcium chloride having a high sodium impurity content such as 1.6% sodium chloride, which method comprises:

(a) forming finely-divided meta-stable vaterite on a continuous basis by continuously adding to an agitated precipitating tank aqueous solutions of calcium chloride and diammonium carbonate in such respective concentrations as to stoichiometrically produce calcium carbonate precipitate and ammonium chloride;

(b) separating the resulting meta-stable vaterite precipitate from the mother liquor, and then resuspending the separated vaterite in an aqueous medium;

(c) heating the resuspended vaterite to a temperature of at least 80° C for a sufficient period of time to cause the crystal structure of said vaterite to completely convert to calcite; and

(d) recovering the resulting calcite, which has a sodium impurity content in the range of from about 10 to 35 ppm, for use in preparing phosphor materials.

4,100,265

PROCESS FOR PREPARATION OF HIGH QUALITY COKE

Kiyoharu Yoshimura, and Masao Hayashi, both of Izumi, Japan, assignors to Koa Oil Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,645
Int. Cl.[2] C01B *31/04, 57/00*
U.S. Cl. 423—449 **6 Claims**

1. A three-step process for the preparation of high quality coke which comprises calcining a green coke obtained according to the delayed coking process in a first step at a temperature of about 600° to about 900° C., then cooling the coke in a second step to about 100° C. or lower and thereafter calcining the coke in a third step at a temperature of about 1200° to about 1500° C.

4,100,266

CONTROL SYSTEM FOR A SULFUR PROCESS

Dexter E. Smith, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1977, Ser. No. 838,029
Int. Cl.[2] C01B *17/04;* **G01N** *7/00*
U.S. Cl. 423—574 R **25 Claims**

1. Apparatus comprising:

a furnace means;

first conduit means for passing a first feed stream containing hydrogen sulfide (H_2S) into said furnace means;

second conduit means for passing a second feed stream containing oxygen into said furnace means to convert part of the H_2S contained in the first feed stream to sulfur dioxide (SO_2);

third conduit means for withdrawing the resulting gaseous reaction mixture, containing free sulfur and unreacted H_2S and SO_2 gases, from said furnace means;

first sulfur removal means to remove at least a part of the free sulfur contained in the said gaseous reaction mixture, thereby producing a denuded gaseous stream containing unreacted H_2S and SO_2;

a catalytic sulfur converter means to convert a portion of the unreacted H_2S and SO_2 gases contained in said denuded gaseous mixture to free sulfur;

second sulfur removal means to remove at least a portion of the free sulfur from the resulting gaseous reaction mixture produced in said catalytic sulfur converter means, thereby producing a primary tail gas stream containing unreacted H_2S and SO_2;

a tail gas cleanup reactor means for further reducing the concentration of H_2S and SO_2 in the primary tail gas stream from said catalytic sulfur converter means;

fourth conduit means for passing a third feed stream containing H_2S gas into said tail gas cleanup reactor means;

means for separating at least part of the free sulfur formed in said tail gas cleanup reactor means from the resulting reaction effluent to produce a secondary tail gas stream;

means for establishing a first signal representative of the actual flow rate of the first feed stream flowing through said first conduit means;

means for establishing a second signal representative of the actual flow rate of the second feed stream flowing through said second conduit means;

means for analyzing said primary tail gas stream flowing from said second sulfur removal means to said tail gas cleanup reactor means and establishing a third signal representative of the H_2S concentration in said primary tail gas stream, a fourth signal representative of the SO_2 concentration in said primary tail gas stream, and a fifth signal representative of the H_2S/SO_2 ratio in said primary tail gas stream;

means for analyzing said secondary tail gas stream and establishing a sixth signal representative of the H_2S concentration in said secondary tail gas stream and a seventh signal representative of a data ready condition;

means for establishing an eighth signal representative of the desired H_2S/SO_2 ratio in said primary tail gas stream;

means for establishing a ninth signal representative of the required volume of said second feed stream necessary to convert a required proportion of the H_2S in a known volume of said first feed stream to SO_2;

means for establishing a 10th signal representative of the desired H_2S concentration in said secondary tail gas stream;

means for producing, in response to said first, said fifth, said eighth, and said ninth signals, an 11th signal representative of the required flow rate of said second feed stream and for utilizing a comparison of said 11th signal and said second signal to manipulate the flow rate of said second feed stream;

means for producing, in response to said first, said seventh and said tenth signals, a 12th signal representative of a feed forward control signal for the H_2S/SO_2 ratio in said primary tail gas stream;

means for producing, in response to said sixth, said seventh and said tenth signals, a 13th signal representative of a feedback control signal for the H_2S concentration in said secondary tail gas stream; and

means for producing, in response to said twelfth and said thirteenth signals, a 14th signal representative of the required flow rate of the third feed stream and for utilizing said 14th signal to manipulate the flow rate of said third feed stream.

17. A method for controlling the conversion of hydrogen sulfide to sulfur, comprising the steps of:

passing a first feed stream containing hydrogen sulfide (H_2S) into a first reaction zone;

passing a second feed stream containing oxygen into said first reaction zone;

in said first reaction zone, converting part of the hydrogen sulfide from said first stream to sulfur dioxide and then reacting part of the thus produced sulfur dioxide with part of the remaining hydrogen sulfide to produce free sulfur;

passing the resulting gaseous reaction mixture containing free sulfur and unreacted hydrogen sulfide and sulfur dioxide gases from said first reaction zone to a first sulfur removal zone and therein removing at least a portion of the free sulfur contained in the mixture, thereby producing a denuded stream containing unreacted hydrogen sulfide and sulfur dioxide;

passing said denuded stream to a catalytic sulfur converter zone and therein converting a portion of the unreacted hydrogen sulfide and sulfur dioxide gases to free sulfur;

passing the resulting gaseous effluent from said catalytic sulfur converter zone to a second sulfur removal zone and therein removing at least a portion of the free sulfur contained in the gaseous effluent to produce a primary tail gas stream containing unreacted hydrogen sulfide and sulfur dioxide;

passing said primary tail gas stream from said second sulfur removal zone to a tail gas cleanup reaction zone;

passing a third feed stream containing hydrogen sulfide gas into said tail gas cleanup reaction zone and therein reacting said primary tail gas stream and said third feed stream;

separating the resulting free sulfur produced in said tail gas cleanup reaction zone to produce a secondary tail gas stream containing the remaining unreacted hydrogen sulfide and sulfur dioxide gases;

establishing a first signal representative of the actual flow rate of said first feed stream;

establishing a second signal representative of the actual flow rate of said second feed stream;

establishing a third signal representative of the hydrogen sulfide concentration in the gas mixture flowing from said second sulfur removal zone, a fourth signal representative of the sulfur dioxide concentration in the gas mixture flowing from said second sulfur removal zone, and a fifth signal representative of the H_2S/SO_2 ratio in the gas mixture flowing from said second sulfur removal zone;

establishing sixth signal representative of the hydrogen sulfide concentration in said secondary tail gas steam and a seventh signal representative of a data ready signal;

establishing an eighth signal representative of the required H_2S/SO_2 ratio in said primary tail gas stream;

establishing a ninth signal representative of the required volume of said second feed stream necessary to convert a required proportion of the hydrogen sulfide in a known volume of said first feed stream to sulfur dioxide;

establishing a 10th signal representative of the desired hydrogen sulfide concentration in said secondary tail gas stream;

producing, in response to said first, said fifth, said eighth and said ninth signals, an 11th signal representative of the required flow rate of said second feed stream and utilizing a comparison of said 11th signal and said second signal to manipulate the flow rate of the said second feed stream;

producing, in response to said first, said third, and said fourth signals, a 12th signal representative of a feed forward control signal for the H_2S/SO_2 ratio in said primary tail gas stream;

producing, in response to said sixth, said seventh, and said tenth signals, a 13th signal representative of a feedback control signal for the hydrogen sulfide concentration in said secondary tail gas stream; and

producing, in response to said twelfth and said thirteenth signals, a 14th signal representative of the required flow rate of said third feed stream and utilizing said 14th signal to manipulate the flow rate of said third feed stream.

4,100,267

METHOD OF DETECTING HEPATITIS B CORE ANTIGEN AND ANTIBODY

Eugene Douglas Shaw, Bridgewater, N.J., assignor to Ortho Diagnostics Inc., Raritan, N.J.

Filed Oct. 1, 1975, Ser. No. 618,644

Int. Cl.[2] A61K *39/00, 39/42, 43/00;* **G01N** *31/00*

U.S. Cl. 424—1 **6 Claims**

1. The method for detecting hepatitis B core antigen in a material suspected of containing said antigen which comprises contacting said material in a system with antibodies to A-2 plaque virus thereby to cause said antigen if present to cross-react with said antibodies, and then determining whether said cross-reaction has occurred.

4. The method for detecting hepatitis B core antibody in a material suspected of containing said antibody which comprises contacting said material in a system with A-2 plaque virus antigen thereby to cause said antibody if present to cross-react with said antigen, and then determining whether said reaction has occurred.

4,100,268

PREPARATION OF GENTAMICIN SENSITIZED PARTICLES FOR AGGLUTINATION TESTS

George H. Scherr, Park Forest, Ill., assignor to Technam, Inc., Park Forest South, Ill.

Filed Mar. 8, 1976, Ser. No. 664,506

Int. Cl.[2] A61K *39/00;* **G01N** *31/00, 33/16*

U.S. Cl. 424—12 **16 Claims**

1. A process for the preparation of an agglutinable gentamicin-macromolecule-carrying particle which process comprises covalently coupling gentamicin to a protein with a carbodiimide derivative and adsorbing or covalently coupling the resultant gentamicin-protein moiety to washed red blood cells, resulting in a particle consisting essentially of the protein, the red blood cell and coupled gentamicin.

8. A process for the preparation of an agglutinable gentamicin-macromolecule-carrying particle which process comprises covalently coupling gentamicin to a protein with a carbodiimide derivative and adsorbing or covalently coupling said gentamicin-protein moiety to microbial cells.

13. A process for the preparation of an agglutinable gentamicin-macromolecule-carrying particle which process comprises covalently coupling gentamicin to a protein with a carbodiimide derivative and adsorbing or covalently coupling said gentamicin-protein moiety to inert polymer particles.

4,100,269

ANTICALCULUS DENTIFRICE

Morton Pader, Teaneck, N.J., assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 374,351, Jun. 28, 1973, abandoned, which is a continuation of Ser. No. 125,389, Mar. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 800,008, Mar. 17, 1969, abandoned. This application May 6, 1977, Ser. No. 794,532

Int. Cl.[2] A61K *7/16, 7/22, 7/24, 31/315*

U.S. Cl. 424—49 **31 Claims**

1. A method for the control of calculus on tooth surfaces comprising contacting the tooth surfaces at regular intervals with at least one physiologically acceptable zinc compound selected from the group consisting of zinc tribromosalicylanilide, zinc-2-hexyl-5-chlorosalicylanilide, zinc soap of the C_8 to C_{22} fatty acids, zinc carbonate, zinc benzoate, zinc dl-lactate trihydrate, zinc citrate, zinc hexafluorosilicate, zinc stannate and zinc silicate, in a physiologically acceptable carrier therefor, said carrier being selected from the group consisting of a mouthwash and a dentifrice composition wherein the abrasives in said dentifrice compositions are substantially free of phosphate and calcium, and wherein said dentifrice has a minimum dentin abrasion value of about 50, the concentration of said zinc compound being effective to reduce the rate of accumulation of calculus, and wherein the maximum concentration of zinc is about 5% by weight of the total composition.

4,100,270

ANTIBACTERIAL ORAL COMPOSITION

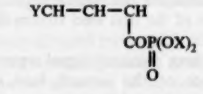
Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 629,749, Nov. 7, 1975, Pat. No. 4,042,679. This application Apr. 25, 1977, Ser. No. 790,781

Int. Cl.[2] A61K *7/22*

U.S. Cl. 424—54 **12 Claims**

1. An oral composition comprising an oral vehicle, a nitrogen containing antibacterial antiplaque agent tending to stain dental surfaces selected from the group consisting of cationic antibacterial antiplaque agent and long chain amine antibacterial antiplaque agent containing a fatty alkyl group of 12 to 18 carbon atoms and a water soluble polymeric polyphosphonic compound antistain additive having the recurring group:



wherein X is selected from the group consisting of hydrogen and an orally acceptably action and Y is selected from the group consisting of hydrogen and CH_3, and the unphosphonated recurring groups of said compound have a total molecular weight of at least about 3,500.

4,100,271
CLEAR, WATER-MISCIBLE, LIQUID PHARMACEUTICAL VEHICLES AND COMPOSITIONS WHICH GEL AT BODY TEMPERATURE FOR DRUG DELIVERY TO MUCOUS MEMBRANES

Joseph Z. Krezanoski, Los Altos, Calif., assignor to Cooper Laboratories, Inc., Parsippany, N.J.

Filed Feb. 26, 1976, Ser. No. 661,612
Int. Cl.[2] A61K *31/74*
U.S. Cl. 424—78 **17 Claims**

1. A method of therapeutically treating the symptoms of Sjogren's syndrome, ophthalmic edema and eye irritation in a mammal, comprising, topically administering to affected eyes of such mammal, a pharmaceutical composition which consists of a clear, water-miscible, physiologically acceptable, liquid composition which gels to a thickened, non-flowing and adhering consistency at human body temperature, the composition comprising an aqueous solution of a polyoxyethylenepolyoxypropylene block copolymer and having a gel transition temperature in the range of from about 25° to about 40° C.

4. A method of medicinally treating a mucous membrane condition in need of pharmacologic treatment comprising contacting such mucous membrane with a clear, water-miscible, physiologically acceptable, liquid composition which gels to a thickened, non-flowing and adhering consistency after contact with the mucous membrane, the liquid composition comprising a pharmacologically effective amount of a chemical material which is pharmacologically active against said condition, and a pharmaceutical vehicle which is a clear, water-miscible, physiologically acceptable liquid having a gel transition temperature in the range of from about 25° to about 40° C.

4,100,272
METHOD OF INCREASING THE RESISTANCE OF SWINE TO SWINE DYSENTERY INFECTION

Robert D. Glock; Delbert L. Harris, and Kent J. Schwartz, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 31, 1977, Ser. No. 801,745
Int. Cl.[2] A61K *39/02*
U.S. Cl. 424—92 **6 Claims**

1. The method of increasing the resistance of swine to swine dysentery infection, characterized by parenterally administering to swine while free of active swine dysentery infection at least 1×10^9 killed cells of a virulent isolate of *Treponema hyodysenteriae.*

4,100,273
ANTIBIOTIC SUBSTANCE FROM *ACTINOPLANES SARVEPARENSIS* CBS 305.76 (ANTIBIOTIC L 13365)

Hermes Pagani; Francesco Parenti; Carolina Coronelli, and Giorgio Tamoni, all of Milan, Italy, assignors to The Dow Chemical Company, Milan, Italy

Filed May 31, 1977, Ser. No. 802,215
Claims priority, application United Kingdom, Jun. 29, 1976, 26934/76
Int. Cl.[2] A61K *35/74*
U.S. Cl. 424—117 **3 Claims**

1. Antibiotic L 13365, said antibiotic having the following characteristics:

(a) Melting point: 210° C;

(b) Approximate elemental composition of 51.35 percent carbon, 5.05 percent hydrogen, 10.50 percent nitrogen, 11.05 percent sulfur and 22.05 percent oxygen;

(c) Ultraviolet spectrum: characteristic ultraviolet absorption bands in the following solvent systems

Solvent	λ_{max} (nm)	$E^{1\%}_{1cm}$
Hydrochloric acid 0.1N	360	103
	290 (shoulder)	
	237	326
Buffer 0.15 M pH 7.5	408 (shoulder)	
	378	67
	290 (shoulder)	
	237	326
Buffer 0.15 M pH 8.8	408	99
	290 (shoulder)	
	238	336

(d) Infrared spectrum: characteristic infrared absorption bands in nujol at the following frequencies (cm^{-1}): 3400 (shoulder), 3350, 3200 (shoulder), 3100 (sharp), 2930 and 2870 (nujol), 2800–2400, 2380 (atmospheric carbon dioxide), 1750 (sharp), 1670 (sharp), 1620 (sharp), 1540 (sharp), 1480 (sharp), 1460 and 1380 (nujol), 1420 (sharp), 1340 (sharp), 1320 (sharp), 1280 (sharp), 1240 (sharp), 1195 (sharp), 1170 (sharp), 1145 (sharp), 1120 (sharp), 1075 (broad), 1015 (sharp), 990 (sharp), 935 (sharp), 920 (broad), 900 (sharp), 865 (sharp), 840 (sharp), 800 (sharp), 770 (sharp), 755 (sharp), 740 (sharp), 720 (nujol);

(e) Specific rotation: $-\alpha]_{436}^{25} = +125°$ (C = 0.8 percent in methanol:chloroform 1:1);

(f) Solubility: — Soluble in dimethylsulfoxide, dimethylformamide and in chloroform/methanol mixtures. Slightly soluble in chloroform, methanol, methanol/ethyl acetate mixtures, sodium bicarbonate solutions and glacial acetic acid; insoluble in water and in the other common organic solvents;

(g) Characteristic reactions:

Fehling	positive
Tollens	positive
$KMnO_4$	positive
H_2SO_4 conc.	dark brown color
Ninhydrin	negative
$FeCl_3$	positive
Millon	negative
Schiff	negative
Anthrone	positive
Folin Ciocalteau	negative
Elson Morgan	negative

(h) Ionizable functions: an ionizable function potentiometrically evidenced with $pK_a = 7.8$ (2-methoxyethanol:water 4:1);

(i) R.F. values: chromatography on Whatman paper No. 1; Visualization of the spots by microbiological development on *Staphylococcus aureus*

Eluting System	Rf value
Buffer pH 6.0 saturated n-butanol	0.75
Water saturated n-butanol + 2% p-toluenesulfonic acid	0.80
Water saturated n-butanol + 2% conc. ammonia	0.70
Butanol saturated buffer pH 6.0	0.0
Ammonium chloride (20% W/V in water)	0.0
n-butanol:methanol:water 40:10:20 containing 0.75 g methyl orange	0.90
n-butanol-methanol:water 40:10:30	0.90
water:acetone 1:1	0.35
water saturated ethyl acetate	0.0–0.31
chloroform:methanol 85:15	0.51

4,100,274

POLYPEPTIDE

Anand Swaroop Dutta; Barrington John Albert Furr, and Michael Brian Giles, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

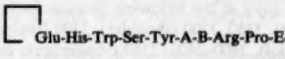
Filed Apr. 22, 1977, Ser. No. 790,003

Claims priority, application United Kingdom, May 11, 1976, 19327/76

Int. Cl.[2] A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 6 Claims

1. A polypeptide of the formula:



in which A is selected from the group consisting of D-Tyr(Me), D-Ser(Bu[t]) and D-Phe, B is selected from the group consisting of Leu or MeLeu, E is Azgly and F is an amino radical, and the pharmaceutically- and veterinarily-acceptable acid-addition salts thereof.

4,100,275

COMPOSITIONS HAVING ANTIBIOTIC PROPERTIES

Frank Ratcliffe Atherton, Welwyn Garden City; Michael John Hall, Welwyn; Cedric Herbert Hassall, Welwyn; Peter Stuart Ringrose, Royston, and Robert Wilson Lambert, Welwyn, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 650,336, Jan. 19, 1976, Pat. No. 4,016,148. This application Jul. 21, 1976, Ser. No. 707,158

Claims priority, application United Kingdom, Jan. 27, 1975, 3417/75; Nov. 20, 1975, 47787/75

Int. Cl.[2] A61K *31/66, 37/14, 31/545, 35/00*

U.S. Cl. 424—211 11 Claims

6. An antibacterial pharmaceutical composition consisting essentially of a pharmaceutically acceptable carrier material and as the active ingredient a mixture of (1R)-1-(L-alanylamino)-ethylphosphonic acid or a pharmaceutically acceptable salt thereof and a cephalosporin selected from the group consisting of cephalothin, cephalexin, cephazolin, cefoxitin, cephamandole, cephaloridin and cephaloglycin wherein the weight ratio of (1R)-1-(L-alanylamino)-ethylphosphonic acid or a pharmaceutically acceptable salt thereof to said cephalosporin is from 1:100 to 100:1; said mixture being presented in said composition in an antibacterially effective amount.

4,100,276

FUSIDIC ACID DERIVATIVES

Welf von Daehne, Rungsted Kyst, and Poul Rodbroe Rasmussen, Frederikssund, both of Denmark, assignors to Leo Pharmaceutical Products Ltd. A/S, Ballerup, Denmark

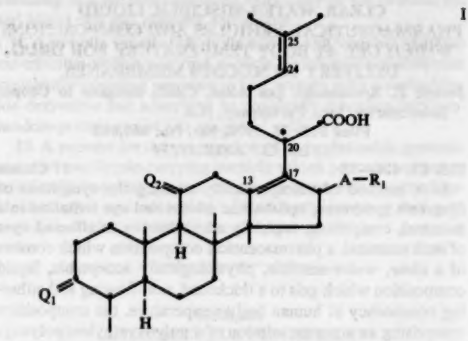
Filed Nov. 24, 1976, Ser. No. 744,978

Claims priority, application United Kingdom, Dec. 3, 1975, 49714/75; Apr. 20, 1976, 16015/76

Int. Cl.[2] A61K *31/56;* C07J *9/00*

U.S. Cl. 424—238 53 Claims

1. A compound of the formula I:



in which formula the dotted line between C-24 and C-25 indicates that the carbon atoms in question are connected by either a double bond or a single bond, and the asterix at C-20 indicates that the compounds exist in two diastereomeric forms; and in which formula Q_1 and Q_2 stand for the group

or oxygen, A represents oxygen or sulphur, and R_1 stands for a straight or branched, unsubstituted or substituted alkyl radical having from 1 to 12 carbon atoms, an alkenyl radical having from 3 to 6 carbon atoms, a cycloalkyl radical having from 3 to 7 carbon atoms in the alicyclic ring, an unsubstituted or halo- or lower alkyl-substituted phenyl-lower alkyl or phenyl radical; a naphthyl radical; or a heterocyclic radical having 5 or 6 ring atoms and containing one oxygen, sulphur or nitrogen atom; the pure diastereomers of the compounds of formula I and mixtures thereof, and pharmaceutically acceptable non-toxic salts and easily hydrolysable esters of the compounds of formula I.

26. A pharmaceutical preparation in dosage unit form for the enteral or parenteral treatment of patients suffering from bacterial infectious diseases, which comprises as an active ingredient at least one compound of formula I, or a pharmaceutically acceptable, non-toxic salt or an easily hydrolysable ester thereof, and an atoxic pharmaceutically acceptable carrier, the quantity of the said active compound being between 0.05 g and 1 g.

4,100,277

4,1-BENZOXAZONINE DERIVATIVES AND PROCESS THEREFOR

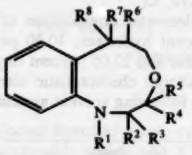
Christopher A. Demerson, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,778

Int. Cl.[2] C07D *267/00;* A61K *31/33*

U.S. Cl. 424—244 31 Claims

1. A compound of formula I



in which R^1 is hydrogen, $CO(CH_2)_nNR^9R^{10}$ wherein n is an integer from 1 to 4 and R^9 and R^{10} each is hydrogen or lower

alkyl, or $CH_2(CH_2)_nNR^9R^{10}$ wherein n, R^9 and R^{10} are as defined herein; R^2 is hydrogen; R^3 is hydrogen; or R^2 and R^3 together are oxo; R^4 is lower alkyl; R^5 is lower alkyl or $(CH_2)_pY$ wherein p is an integer from 1 to 5 and Y is halo, lower alkoxycarbonyl or $CONR^{11}R^{12}$ wherein R^{11} and R^{12} each is hydrogen or lower alkyl; R^6 is hydrogen or lower alkyl; and R^7 is hydrogen and R^8 is amino; or R^7 is hydroxy and R^8 is hydrogen, lower alkyl or phenyl; or R^7 and R^8 together are oxo, with the proviso that when R^2 and R^3 together are oxo and R^4, R^5, R^6, R^7 and R^8 are as defined herein then R^1 is hydrogen; and with the additional proviso that when R^2 and R^3 are hydrogen and R^1, R^4 and R^6 are as defined herein then R^5 is lower alkyl; R^7 is hydroxy; and R^8 is hydrogen, lower alkyl or phenyl, or a therapeutically acceptable salt thereof.

20. A method for treating hypertension in a mammal which comprises administering to said mammal an effective antihypertensive amount of a compound selected from those of formula I, or a therapeutically acceptable salt thereof, as claimed in claim **1**.

4,100,278

NOVEL BENZAZEPINES

Lucien Nedelec, Le Raincy; Daniel Fréchet, Paris; Claude Dumont, Nogent-sur-Marne, and Marie-Helene Kannengiesser, Paris, all of France, assignors to Roussel Uclaf, Paris, France

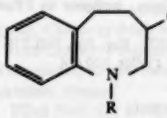
Filed Mar. 30, 1977, Ser. No. 782,747

Claims priority, application France, Mar. 31, 1976, 76 09333

Int. Cl.[2] A61K *31/55;* C07D *223/16*

U.S. Cl. 424—244 **11 Claims**

1. A compound selected from the group consisting of benzazepines of the formula



wherein *n* is 0 or 1 and R and R_1 are individually selected from the group consisting of hydrogen and methyl with the proviso that when R_1 is methyl, R is also methyl and their non-toxic, pharmaceutically acceptable acid addition salts.

9. A method of relieving depression in warm-blooded animals comprising administering to warm-blooded animals an antidepressant amount of at least one compound of claim **1**.

4,100,279

Patent Not Issued For This Number

4,100,280

1,3-DIALKYL-6,7-METHOXY-1H-1,2,4-BENZOTHIADIAZINE-1-OXIDES

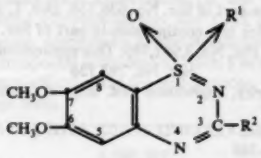
Robert D. Dillard, Zionsville, and Donald E. Pavey, Bargersville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 8, 1977, Ser. No. 822,465

Int. Cl.[2] C07D *285/24;* A61K *31/38, 31/54*

U.S. Cl. 424—246 **8 Claims**

1. A compund of the formula



wherein R^1 and R^2, individually, are C_1—C_3 alkyl, and pharmaceutically-acceptable acid addition salts thereof.

8. The method of reducing blood pressure in a mammal with elevated blood pressure and in need of treatment which comprises administering a hypotensive dose of a compound according to claim **1** sufficient to lower said elevated blood pressure in said hypertensive mammal.

4,100,281

MONO-5-SUBSTITUTED-THIO-3-CHLORO-4H-1,2,6-THIADIAZIN-4-ONE ANTIFUNGAL AGENTS

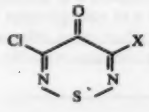
Clinton Joseph Peake; Wayne Nelson Harnish, both of Medina, and Bruce Lloyd Davidson, Middleport, all of N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 30, 1977, Ser. No. 782,816

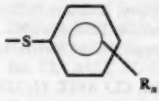
Int. Cl.[2] A01N *9/12*

U.S. Cl. 424—246 **5 Claims**

1. A method for control of fungal disease of plants comprising applying to the locus where control is desired an effective fungistatic or fungicidal amount of a compound having the formula:



wherein X is alkylthio having 1 to 8 carbon atoms, phenylthio, phenyl (lower)-alkylthio, cycloalkylthio having 5 to 7 ring carbon atoms or substituted phenylthio having the formula:



wherein each R is independently lower alkyl, lower alkoxyl, lower acylamino having 1 to 4 carbon atoms, lower alkoxycar-

bonyl, nitro, cyano or halogen and *n* is an integar having a value of 1 to 3 inclusive, with the proviso that when R is lower alkyl or halogen *n* maybe an integer having a value of 1 to 5 inclusive.

4,100,282

N-ARYL-N'-(PHENYL- OR PHENOXY-ALKYL)-PIPERAZINES AND SALTS THEREOF

Ernst-Otto Renth; Anton Mentrup; Kurt Schromm, all of Ingelheim am Rhein, and Peter Danneberg, Ockenheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

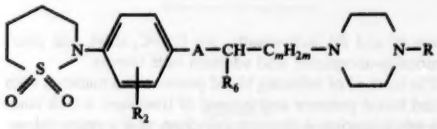
Continuation-in-part of Ser. No. 636,734, Dec. 1, 1975, Pat. No. 4,038,279, which is a continuation-in-part of Ser. No. 427,367, Dec. 21, 1973, Pat. No. 3,941,789. This application May 4, 1977, Ser. No. 793,736

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1972, 2263211

Int. Cl.[2] C07D *279/02;* A01K *31/54*

U.S. Cl. 424—246 **4 Claims**

1. A racemic or optically active compound of the formula



wherein

R is phenyl; phenyl having one or two substituents attached thereto, said substituents being selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, chlorine and trifluoromethyl; naphthyl; tetrahydronaphthyl; indanyl; pyridyl, isoquinolyl; or thiazolyl;

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen,

A is a single carbon-to-carbon bond or $—OCH_2—$,

R_6 is hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms or alkanoyloxy of 1 to 4 carbon atoms, and

m is 0, 1, 2, 3, 4 or 5, but other than 0 when R_6 is hydroxyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4. The method of depressing the central nervous system of a warm-blooded animal in need of such treatment, which comprises perorally, parenterally or rectally administering to said animal an effective CNS-depressing amount of a compound of claim 1.

4,100,283

GROWTH PROMOTING FEED ADDITIVE OXADIAZINES

Manfred Kühne, Pfeffingen; Clemens Kocher, Therwil, and Jean Jacques Gallay, Magden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

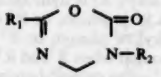
Filed Mar. 24, 1977, Ser. No. 780,897

Claims priority, application Switzerland, Apr. 1, 1976, 4066/76

Int. Cl.[2] A61K *31/535*

U.S. Cl. 424—248.5 **1 Claim**

1. A process for promoting the growth of domestic animals and productive livestock which comprises administering to said animals and livestock an effective growth promoting amount of a compound corresponding to the formula



wherein

R_1 represents a 5- or 6-membered, N-, S- or O-containing heterocyclic-aromatic radical, selected from the group consisting of pyrazinyl, pyrrolyl, thiazolyl, imidazolyl, pyrimidinyl, furyl, thienyl, pyridinyl, quinolinyl, indolyl and benzofuranyl optionally substituted by halogen, lower alkyl, phenyl, nitro, cyano, $(R_3)_2NCO—$, $(R_3)_2N—$, $R_3O—$, $R_3SO_2—$, $R_3SO—$ or $R_3S—$,

R_2 represents lower alkyl, C_2–C_6 alkenyl or C_3–C_6 cycloalkyl optionally bound by way of an alkylene bridge, and

R_3 represents lower alkyl, C_2–C_6 alkenyl or alkoxyalkyl having a total of up to 8 carbon atoms, or the quaternary ammonium compounds or N-oxides of the N-containing heterocyclic-aromatic radicals.

4,100,284

1,4-DIOXO- AND 4-OXOQUINOXALINE-2-CARBOXALDEHYDE SULFONYLHYDRAZONES AND CERTAIN DERIVATIVES THEREOF

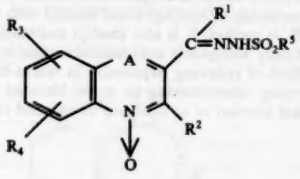
Berkeley W. Cue, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 18, 1977, Ser. No. 760,271

Int. Cl.[2] C07D *239/76*

U.S. Cl. 424—250 **14 Claims**

1. A compound of the formula



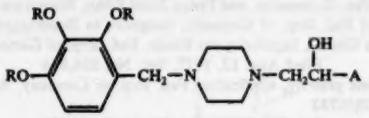
wherein A is N; R^1, R^2, R^3 and R^4 are each hydrogen; and R^5 is a member selected from the group consisting of methylphenyl and methoxyphenyl.

4,100,285
N-SUBSTITUTED TRIALKOXYBENZYL PIPERAZINE DERIVATIVES

Hiromu Murai, Otsu, and Yoshiaki Aoyagi, Kyoto, both of Japan, assignors to Nippon Shinyaku Co., Ltd., Kyoto, Japan

Filed Apr. 1, 1977, Ser. No. 783,561
Claims priority, application Japan, Apr. 9, 1976, 51-40782; Apr. 9, 1976, 51-40783; Apr. 9, 1976, 51-40784
Int. Cl.[2] C07D *295/08, 413/06*
U.S. Cl. 424—250 15 Claims

1. A compound of the formula:



wherein each

R independently of the other is methyl or ethyl; and

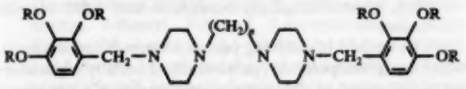
A is hydrogen, methyl, ethyl, hydroxymethyl, phenyl, naphthyloxymethyl or phenoxymethyl unsubstituted or substituted by chloro, bromo, fluoro, hydroxy, methoxy, ethoxy, benzyloxy or alkyl of 1 to 4 carbon atoms,

and the pharmaceutically acceptable acid addition salts thereof.

12. A pharmaceutical composition useful for improving the cardiovascular activity of a human or animal, which comprises a therapeutically effective amount of the compound of claim 1 in combination with a pharmaceutical carrier.

14. The compound N-(2,3,4-trimethoxybenzyl)-N'-(2-morpholinoethyl)piperazine, or the trihydrochloride salt thereof.

15. A compound of the formula:



wherein each

R is independently methyl or ethyl; and *n* has a value of from 2 to 8,

and the pharmacetically acceptable acid addition salts thereof.

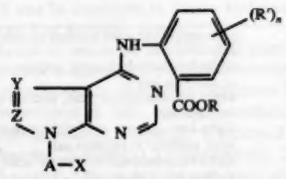
4,100,286
2-(SUBSTITUTED HETEROCYCLIC AMINE)BENZOIC ACIDS

Gilbert Regnier, Chatenay-Malabry; Roger Canevari, Villebon-/Yvette; Jean-Claude Poignant, Bures/Yvette, and Michel Laubie, Vaucresson, all of France, assignors to Science Union et Cie, Suresnes, France

Filed Nov. 15, 1976, Ser. No. 741,740
Claims priority, application United Kingdom, Nov. 19, 1975, 47618/75
Int. Cl.[2] A61K *31/505, 31/52;* C07D *473/00, 487/04*
U.S. Cl. 424—251 10 Claims

1. A compound selected from the group consisting of:

(A) heterocyclic compounds of the formula I



I

wherein:

one of Y and Z is CH and the other is nitrogen;

A is selected from the group consisting of straight and branched saturated acyclic hydrocarbon chains having from 2 to 6 carbon atoms inclusive;

X is selected from the group consisting of chlorine, hydroxy, alkoxy and alkylthio each having from 1 to 5 carbon atoms inclusive;

R is selected from the froup consisting of hydrogen, alkyl, hydroxyalkyl and dihydroxyalkyl each having from 1 to 3 carbon atoms inclusive;

R' is selected from the group consisting of halogen, alkyl and alkoxy each having from 1 to 3 carbon atoms inclusive, and

n is selected from the group consisting of 0, 1 and 2; and

(B) physiologically tolerable addition salts thereof.

10. A pharmaceutical composition, in unit dosage form, useful in treating convulsions and like CNS disorders of a depressive nature, comprising a pharmaceutically-acceptable carrier and a compound according to claim 1 as active ingredient in an amount effective for the said purpose, at least 10 mg per unit dosage form.

4,100,287
PYRIMIDINE DERIVATIVE

Andre Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France

Filed Aug. 30, 1977, Ser. No. 829,004
Claims priority, application United Kingdom, Sep. 3, 1976, 36523/76
Int. Cl.[2] A61K *31/505;* C07D *239/42*
U.S. Cl. 424—251 5 Claims

1. N-2, 6-dichlorophenyl-2-aminopyrimidine.

4. A therapeutic composition having analgesic activity, said therapeutic composition comprising a carrier and an effective amount of N-2, 6-dichlorophenyl-2-aminopyrimidine.

4,100,288
N-TETRAHYDROFURFURYL-NOROXYMORPHONES, THEIR SALTS, AND ANALGESIC COMPOSITIONS AND METHODS EMPLOYING THEM

Herbert Merz, Ingelheim am Rhein; Gerhard Walther, Bingen (Rhein); Adolf Langbein, Ingelheim am Rhein; Klaus Stockhaus, Bingen (Rhein), and Helmut Wick, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Aug. 13, 1976, Ser. No. 714,045
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1975, 2538075
Int. Cl.[2] A61K *31/485;* C07D *489/08*
U.S. Cl. 424—260 3 Claims

1. N-(R-tetrahydrofurfuryl)-noroxymorphone or a non-toxic, pharmacologically acceptable acid addition salt thereof.

2. An analgesic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective analgesic amount of a compound of claim 1.

3. The method of relieving pain in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective analgesic amount of a compound of claim 1.

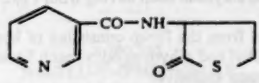
4,100,289
AMIDIC DERIVATIVES OF NICOTINIC ACID AS THERAPEUTICS

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau, Italy

Division of Ser. No. 668,498, Mar. 19, 1976, Pat. No. 4,021,433, which is a continuation-in-part of Ser. No. 451,694, Mar. 15, 1974, abandoned. This application Dec. 27, 1976, Ser. No. 754,525
Int. Cl.[2] A61K *31/455*
U.S. Cl. 424—266 2 Claims

1. (Amended) A Pharmaceutical composition for the treatment of elevated serum cholesterol, elevated serum free fatty acid levels, elevated serum lipids and/or impaired BSP clear-

ance containing as an active component thereof an effective amount of the compound homocysteine thiolactone nicotinamide:



and a non-toxic, pharmacologically acceptable salt thereof.

4,100,290

PYRIDINE-4-CARBOXYLIC ACID HYDRAZONES FOR COMBATTING PHYTOPATHOGENIC MICROORGANISMS

Karl Gatzi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

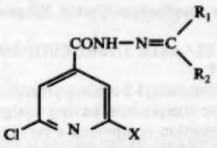
Continuation-in-part of Ser. No. 685,594, May 12, 1976, abandoned. This application Dec. 13, 1976, Ser. No. 749,863

Claims priority, application Switzerland, May 14, 1975, 06192/75; Apr. 2, 1976, 04148/76

Int. Cl.[2] A61K *31/455;* **C07D** *213.86*

U.S. Cl. 424—266 **28 Claims**

1. A compound of formula I



wherein

X represents chlorine, methyl or methoxy

R_1 represents hydrogen or C_1-C_6-alkyl, and

R_2 represents C_1-C_6-alkyl, C_3-C_4-alkenyl, alkyl(C_1-C_4)-carbonyl or phenyl, or

R_1 and R_2 together represent a C_4-C_6-alkylene chain,

whereby the total number of carbon atoms of the radicals R_1 and R_2 is three or more as well as the microbicidally effective acid addition salts thereof.

15. A method for combatting phytopathogenic microorganisms which comprises applying thereto or to the locus thereof a microbicidally effective amount of a compound as claimed in claim 1.

4,100,291

NOVEL 1,4-BENZODIOXANES

Francois Clemence, Paris, and Daniel Humbert, Fontenay-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

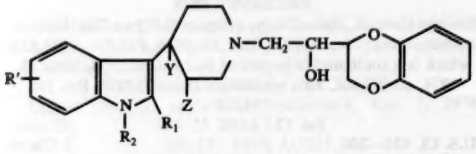
Filed Apr. 28, 1977, Ser. No. 791,927

Claims priority, application France, Apr. 30, 1976, 76 12941

Int. Cl.[2] C07D *319/20*

U.S. Cl. 424—267 **19 Claims**

1. A compound selected from the group consisting of 1,4-benzodioxanes of the formula



wherein R' is selected from the group consisting of hydrogen, alkoxy of 1 to 5 carbon atoms, chlorine, bromine and fluorine, R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms and Y and Z are hydrogen or together form a double bond in the form of their racemic mixtures or optically active isomers and their non-toxic, pharmaceutically acceptable acid addition salts.

4,100,292

2-[N-PHENYL-N-(CYCLOALKYL-METHYL)-AMINO]-2-IMIDAZOLINES AND SALTS THEREOF

Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein; Klaus Stockhaus, Bingen am Rhein; Wolfgang Hoefke, Budenheim, and Franz Josef Köhn, Bingen am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

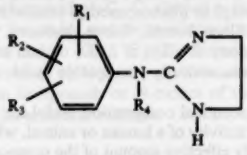
Filed Aug. 12, 1977, Ser. No. 824,044

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636732

Int. Cl.[2] C07D *233/50;* **A61K** *31/415*

U.S. Cl. 424—273 R **4 Claims**

1. A compound of the formula



wherein

R_1, R_2 and R_3 are hydrogen, fluorine, chlorine, bromine, methyl, ethyl, methoxy, trifluoromethyl or cyano; and

R_4 is (cycloalkyl of 3 to 6 carbon atoms)-methyl; and non-toxic, pharmacologically acceptable acid addition salts thereof.

4. The method of relieving pain in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective analgesic amount of a compound of claim 1.

4,100,293

TREATMENT OF HEPATIC DISORDERS WITH THERAPEUTIC COMPOSITIONS COMPRISING KETO ANALOGS OF ESSENTIAL AMINO ACIDS

Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 461,222, Apr. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 355,327, Apr. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 270,986, Jul. 12, 1972, abandoned. This application Mar. 23, 1976, Ser. No. 669,589

Int. Cl.[2] A61K *31/40, 31/19, 31/195*

U.S. Cl. 424—274 **25 Claims**

1. A composition for improving nitrogen balance in patients having hepatic disorders comprising a mixture in form for oral or parenteral administration to adults suffering from such disorders, said composition consisting essentially of the components in the following approximate proportions by weight:

0.0 to 3.0 grams	phenylpyruvic acid; sodium or calcium salt
4.0 to 8.0 grams	alpha-ketoisovaleric acid; sodium or calcium salt
3.0 to 5.0 grams	alpha ketoisocaproic acid; sodium or calcium salt
0.0 to 3.0 grams	alpha-keto-gamma-methylthiobutyric acid; sodium or calcium salt
2.0 to 4.0 grams	alpha-keto-beta-methylvaleric acid; sodium or calcium salt
~0 to 0.1 gram	L-tryptophan
~0 to 0.4 gram	L-threonine
~0 to 0.4 gram	L-lysine monohydrochloride
1.0 to 4.0 grams	L-arginine.

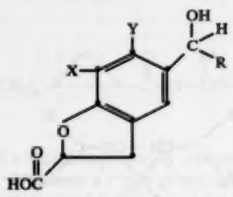
4,100,294

5-(HYDROXY (SUBSTITUTED) METHYL)-2,3-DIHYDROBENZO FURAN-2-CARBOXYLIC ACID AND ITS DERIVATIVES

Edward J. Cragoe, Jr., Lansdale; Otto W. Woltersdorf, Jr., and William Hoffman, both of Chalfont, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 6, 1976, Ser. No. 747,840
Int. Cl.[2] C07D *307/82;* A61K *31/18, 31/34, 31/425*
U.S. Cl. 424—275 14 Claims

1. A compound having the formula:



wherein

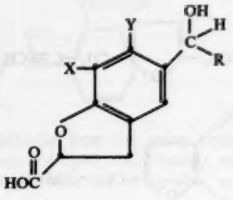
X is halo, methyl or hydrogen;

Y is halo or methyl and

X and Y can be combined to form a hydrocarbylene radical of from 3 to 4 carbon atoms;

R is phenyl or mono or disubstituted phenyl wherein the substituent is halo, methyl, trifluoromethyl or methoxy; benzyl or mono- or di-nuclear substituted benzyl wherein the substituent is halo, methyl, methoxy or trifluoromethyl, 2-thienyl, 3-thienyl, 5-methyl-2-thienyl, 1,2,5-thiadiazolyl, 3-methyl-1,2,5-thiadiazolyl, 2-furyl, 3-furyl, and 5-methyl-2-furyl, and the non-toxic pharmaceutically acceptable salt, lower alkyl ester and the mono or di lower alkyl, piperidine and morpholine amides thereof.

7. A pharmaceutical composition comprising a therapeutically effective amount of a compound of the formula of



wherein

X is halo, methyl or hydrogen;

Y is halo or methyl,

X and Y can be combined to form a hydrocarbylene radical of from 3 or 4 carbon atoms,

R is phenyl or mono or disubstituted phenyl wherein the substituent is halo, methyl, trifluoromethyl or methoxy; benzyl or mono- or di-nuclear substituted benzyl wherein the substituent is halo, methyl, methoxy or trifluoromethyl, 2-thienyl, 3-thienyl, 5-methyl-2-thienyl, 1,2,5-thiadiazolyl, 3-methyl-1,2,5-thiadiazolyl, 2-furyl, 3-furyl, and 5-methyl-2-furyl, and the non-toxic pharmaceutically acceptable salt, lower alkyl ester and the mono or di lower alkyl, piperidine and morpholine amides thereof and a pharmaceutically acceptable carrier.

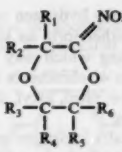
4,100,295

DIOXANE OXIME COMPOUNDS AND PESTICIDAL DIOXANE CARBAMOYLOXIME DERIVATIVES

Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 699,960, Jun. 25, 1976, Pat. No. 4,062,969.
This application Aug. 1, 1977, Ser. No. 820,613
Int. Cl.[2] A01N *9/28*
U.S. Cl. 424—278 21 Claims

1. A compound of the formula:



wherein:

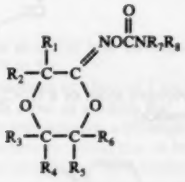
R_1 and R_2 are individually hydrogen or alkyl;

R_3, R_4, R_5, and R_6 together form an alkenylene chain completing a benzene ring which may be optionally substituted with from 0 to 4 substitutents selected from among fluoro, bromo, chloro, nitro, alkyl, cyano, alkoxy alkylthio or trihalomethyl groups;

Z is hydrogen or

wherein R_7 and R_8 are individually hydrogen or alkyl or when R_7 is alkyl, R_8 may also be alkanoyl or haloalkanoyl; with the proviso that R_1 R_2, R_3, R_4, R_5, R_6, R_7 and R_8 substituents individually may not include more than eight aliphatic carbon atoms.

10. An insecticidal and miticidal composition comprising an acceptable carrier and or the active toxicant and insecticidally or miticidally effective amount of a compound of the formula:



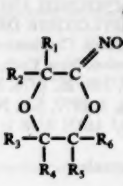
wherein:

R_1 and R_2 are individually hydrogen or alkyl;

R_3, R_4, R_5 and R_6 together form an alkenylene chain completing a benzene ring which may be optionally substituted with from 0 to 4 substituents selected from among fluoro, bromo, chloro, nitro, alkyl, cyano, alkoxy, alkylthio or trihalomethyl groups.

R_7 and R_8 are individually hydrogen or alkyl or when R_7 is alkyl, R_8 may also be alkanoyl or haloalkanoyl; with the proviso that R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 substituents individually may not include more than eight aliphatic carbon atoms.

16. A method of controlling insects and mites which comprises subjecting them to an insecticidally or miticidally effective amount of a compound of the formula:



wherein:

R_1 and R_2 are individually hydrogen or alkyl;

R_3, R_4, R_5 and R_6 together form an alkenylene chain completing a benzene ring which may be optionally substituted with from 0 to 4 substituents selected from among fluoro, bromo, chloro, nitro, alkyl, alkanoxy, alkylthio or trihalomethyl groups;

R_7 and R_8 are individually hydrogen or alkyl or when R_7 is alkyl R_8 may also be alkanoyl or haloalkanoyl; with the proviso that R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 substituents individually may not include more than eight aliphatic carbon atoms.

4,100,296

DIOXOLANE DERIVATIVES

Saleem Farooq, Aesch, and Friedrich Karrer, Zofingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

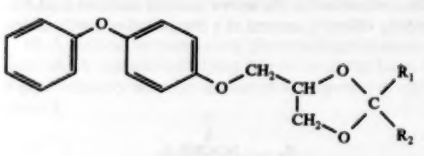
Filed Dec. 7, 1976, Ser. No. 748,268

Claims priority, application Switzerland, Dec. 12, 1975, 16154/75; Dec. 24, 1975, 16784/75; Nov. 15, 1976, 14351/76

Int. Cl.² A61K *31/335;* **C07D** *317/10;* **A01N** *9/28*

U.S. Cl. 424—278 **13 Claims**

1. A compound of the general formula I

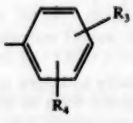


(I),

wherein

R_1 represents a hydrogen atom or a C_1-C_4-alkyl group,

R_2 represents the radical



each of R_3 and R_4 independently represents a hydrogen atom, a halogen atom, a C_1–C_4-alkyl, methoxy or ethoxy group.

11. An insecticidal and acaricidal composition comprising as active ingredient an insecticidally and acaricidally effective amount of a compound of the general formula I as defined in claim 1 in admixture with a suitable carrier therefor.

12. A method for controlling insects and acarids, which comprises applying to the locus thereof an insecticidally and acaricidally effective amount of at least one compound of the general formula I as defined in claim 1.

4,100,297

NOVEL ANTI-ACARID METHODS

Jean André Grandadam, Saint-Maur des Fosses, and Simone Heurtaux, Clichy-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

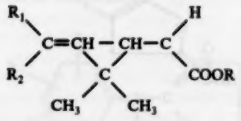
Filed Feb. 22, 1977, Ser. No. 770,303

Claims priority, application France, Feb. 19, 1976, 76 04560

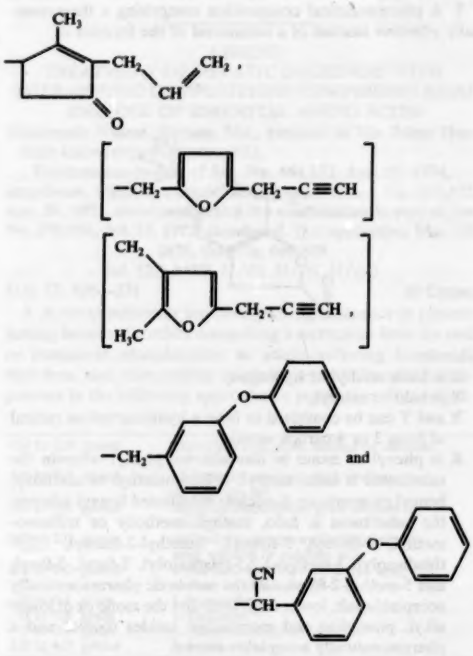
Int. Cl.² A61K *31/275, 31/215*

U.S. Cl. 424—304 **16 Claims**

1. A method of combatting acarids in warm-blooded animals comprising topically applying to warm-blooded animals an antiacaridally effective amount of at least one compound selected from the group consisting of cis and trans, racemic and optically active isomers of a compound of the formula



wherein R_1 is selected from the group consisting of hydrogen, halogen and alkyl of 1 to 8 carbon atoms, R_2 is selected from the group consisting of hydrogen, halogen, alkyl of 1 to 8 carbon atoms and alkoxy carbonyl of 2 to 8 carbon atoms and R_1 and R_2 taken together with the carbon atom to which they are attached form a cycloalkyl of 3 to 6 carbon atoms and R is selected from the group consisting of

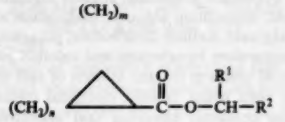


4,100,298
DISPIROCYCLOPROPANE CARBOXYLATE PESTICIDES

Royston H. Davis, and Robert J. G. Searle, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 23, 1977, Ser. No. 771,236
Claims priority, application United Kingdom, Mar. 22, 1976, 11440/76
Int. Cl.[2] A01N *9/24*; C07C *121/66*; A01N *9/20*
U.S. Cl. 424—304 8 Claims

1. A dispirocyclopropane carboxylate derivative of the formula



wherein *m* and *n* each independently represents an integer of from 2 to 5; R^1 represents a cyano group; and R^2 represents a phenyl group substituted by phenoxy or benzyl.

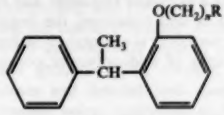
6. A method of combating insect or arachnid pests at a locus which comprises applying to the locus an insecticidally or acaracidally effective amount of a dispirocyclopropane carboxylate derivative according to claim 1 or a composition thereof.

4,100,299
PHARMACEUTICALLY ACTIVE 2-OMEGA-AMINOALKOXYDIPHENYLMETHYLMETHANES

Ryoji Kikumoto, Machida; Akihiro Tobe, Kawasaki; Shinji Tonomura, Tokyo, and Hidenobu Ikoma, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 646,521, Jan. 5, 1976, abandoned. This application Jun. 1, 1977, Ser. No. 802,494
Int. Cl.[2] A01N *9/20*; C07C *93/06*
U.S. Cl. 424—330 11 Claims

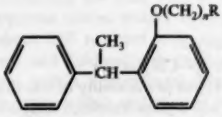
1. A compound having the formula (I):



(I)

wherein R is selected from the group consisting of amino, C_1–C_3 alkylamino and C_2–C_6 dialkylamino, and *n* is an integer of 4; or a pharmaceutically acceptable acid addition salt thereof.

8. A method for palliating conditions of depression in warm-blooded animals which comprises administering to said animal an antidepressant effective amount of a compound of the formula (I):



(I)

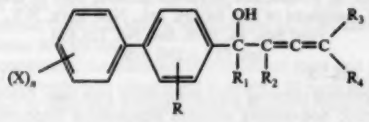
wherein R is selected from the group consisting of amino, C_1–C_3 alkylamino and C_2–C_6 dialkylamino, and *n* is an integer of 4; or a pharmaceutically acceptable acid addition salt thereof.

4,100,300
P-(SUBSTITUTED AND UNSUBSTITUTED-PHENYL)-1-PHENYL-2,3-BUTADIEN-1-OLS AS PHARMACEUTICAL AGENTS

Eugene E. Galantay, Liestel, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 614,538, Sep. 18, 1975, Pat. No. 4,032,580, which is a division of Ser. No. 405,478, Oct. 11, 1973, Pat. No. 3,929,902, which is a continuation-in-part of Ser. No. 219,129, Jan. 19, 1972, abandoned. This application Feb. 17, 1977, Ser. No. 769,530
Int. Cl.[2] A61K *31/045*; C07C *43/20*
U.S. Cl. 424—343 13 Claims

1. A pharmaceutical composition suitable for treating inflammation comprising a compound of the formula:



wherein

R is a hydrogen atom, or halo having an atomic weight of from about 19 to 80;

R_1 is a hydrogen atom or alkyl of 1 to 3 carbon atoms;

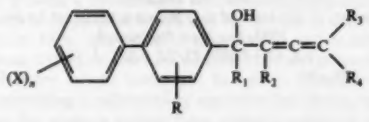
R_2 is a hydrogen atom or methyl; and

R_3 and R_4 are, independently, a hydrogen atom or alkyl of 1 to 3 carbon atoms, provided that at least one of R_3 and R_4 is a hydrogen atom when R_2 is methyl;

X is a hydrogen atom, halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms; and

n is an integer from 1 to 5 in an amount of from about 5 to 1500 milligrams; and a pharmaceutically acceptable carrier.

7. The method of treating inflammation in a mammal which comprises administering to said mammal an inflammation-relieving amount of a compound of the formula:



wherein

R is a hydrogen atom, or halo having an atomic weight of from about 19 to 80;

R_1 is a hydrogen atom or alkyl of 1 to 3 carbon atoms;

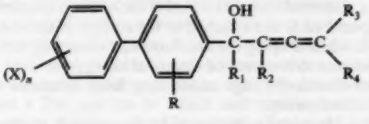
R_2 is a hydrogen atom or methyl; and

R_3 and R_4 are, independently, a hydrogen atom or alkyl of 1 to 3 carbon atoms, provided that at least one of R_3 and R_4 is a hydrogen atom when R_2 is methyl;

X is a hydrogen atom, halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms; and

n is an integer from 1 to 5.

12. The method of effecting sedation/tranquillization in a mammal which comprises administering to said mammal a sedating/tranquillizing-effective amount of a compound of the formula:



wherein

R is a hydrogen atom, or halo having an atomic weight of from about 19 to 80;
R_1 is a hydrogen atom or alkyl of 1 to 3 carbon atoms;
R_2 is a hydrogen atom or methyl; and
R_3 and R_4 are, independently, a hydrogen atom or alkyl of 1 to 3 carbon atoms, provided that at least one of R_3 and R_4 is a hydrogen atom when R_2 is methyl;
X is a hydrogen atom, halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms; and
n is an integer from 1 to 5.

4,100,301
CHEWING GUM CONTAINING NON-DUSTING COLORS AND METHOD

Dominick R. Friello, and Raymond L. Roy, both of Danbury, Conn., assignors to Life Savers, Inc., New York, N.Y.

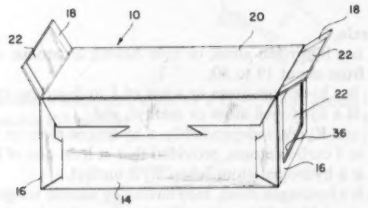
Filed Sep. 16, 1976, Ser. No. 723,430
Int. Cl.[2] A23G *3/30*
U.S. Cl. 426—3 **5 Claims**

1. A colored chewing gum comprising gum base, flavor, and a non-toxic non-dusting colorant composition dispersed substantially uniformly in and throughout said gum base, said colorant composition comprising one or more FD&C lake colors dispersed in an animal or vegetable food grade fatty acid or oil, said colorant composition being present in an amount within the range of from about 0.03 to about 3% by weight of said colored chewing gum, said chewing gum being substantially uniform in color and color intensity throughout and substantially free of color steaking.

4,100,302
CONTAINER FOR ELECTRICAL RESISTANCE COOKING

Ernst Theodore Theimer, Rumson, and George E. Heinze, East Brunswick, both of N.J., assignors to Lectrofood Corp., East Brunswick, N.J.

Continuation-in-part of Ser. No. 675,773, Apr. 12, 1976, Pat. No. 4,016,297, which is a continuation-in-part of Ser. No. 446,822, Feb. 28, 1974, Pat. No. 3,966,972. This application Dec. 3, 1976, Ser. No. 747,307
The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.
Int. Cl.[2] B65B *25/22*; A23L *3/32*
U.S. Cl. 426—90 **12 Claims**



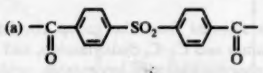
1. A container and composition of matter used in connection with the electrical resistance cooking of electrically high conducting food substances which comprises:
(a) An electrically insulated container which defines a food cavity having a substantially uniform longitudinal cross sectional area, and an aperture in each of its two most diametrically opposite ends;
(b) An electrical contact located at each of said diametrically opposite ends and attached to the surface of the container ends while draping the apertures and extending out of the container to a source of electrical energy;
(c) An electrically high conducting food substance within said food cavity;
(d) An electrically high conducting edible composition forming a continuous phase and coated onto and being an integral part of a portion of the electrically high conducting food substance and positioned to make intimate nonarcing contact between the electrically high conducting food substance and the electrical contacts, with the entire portion of the electrically high conducting edible composition which is in contact with each of said electrical contacts, consisting essentially of:
(i) A gel selected from the group consisting of agar, xanthan gum, tragacanth, guar gum, gum arabic and algin gum; and
(ii) A substantially ionized species selected from the group consisting of sodium chloride, potassium chloride, ammonium chloride, magnesium chloride, sodium glutamate, potassium glutamate, sodium alginate, potassium alginate, ammonium alginate, magnesium alginate, calcium alginate, sodium bicarbonate, potassium bicarbonate, magnesium bicarbonate and calcium bicarbonate,
said electrical contacts located at each of said diametrically opposite ends being flexible electrical contacts located inside the container covering said apertures with said contacts extending outside the container along a flap at each end, said contacts being sufficiently flexible so that a plunging means can be inserted through said apertures and urge the flexible electrical contacts into form fitting contact with said electrically high conducting edible composition and said food substance, wherein the weight ratio gel to substantially ionized species is from about 1:20 up to about 20:1 and wherein the ratio of the surface area of said electrically high conducting food substance coated with said composition of gel and substantially ionized species to surface area of electrically high conducting food substance not coated being in the range of from 1:100 up to 1:10.

4,100,303
ISOPHTHALIC ACID/P,P-SULFONYLDIBENZOIC ACID/ETHYLENE GLYCOL/NEOPENTYL GLYCOL POLYESTER COMPOSITIONS AND CONTAINERS MADE THEREFROM

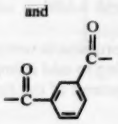
Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 643,283, Dec. 22, 1975, Pat. No. 4,049,631. This application Jan. 17, 1977, Ser. No. 759,974
Int. Cl.[2] B65D *85/00*; C12C *1/06*
U.S. Cl. 426—106 **8 Claims**

2. In a package comprising a polyester container and foodstuffs or medicines enclosed in said container, the improvement wherein said polyester container is a container formed of a polyester, the repeating units of said polyester consisting essentially of

(a) 

and

(b) 

and (c) —O—CH_2—CH_2—O—
and (d) —O—CH_2—$C(CH_3)_2$—CH_2—O—,
said polyester having an oxygen permeability of less than 15 cc-mil/100 in.^{2}-day-atm. and a glass transition temperature in excess of 72° C., said (a) and (b) units and said (c) and (d) units respectively being the units formed by reactively combining polyester forming precursors thereof in an amount of at least one mole of the precursors of said (c) and (d) units per mole of precursors of said (a) and (b)

units and wherein the precursors of said units in forming said polyester by said reactive combining are in a molar ratio of said (b) unit precursor to said (a) unit precursor of about 80:20 to about 20:80 and a molar ratio of said (c) unit precursor to said (d) unit precursor of about 80:20.

4,100,304

METHOD FOR PRODUCING AND PROCESSING FROZEN CONFECTIONS

Harlan R. Getman, Toledo, Ohio, assignor to Vroman Foods, Inc., Toledo, Ohio

Filed May 4, 1977, Ser. No. 793,635
Int. Cl.[2] A23G *9/04, 9/24*
U.S. Cl. 426—281 7 Claims

1. The method of processing confections that become viscous at reduced temperatures including advancing disc-like bodies of viscous confection by a conveyor, the disc-like bodies having central voids, supplying a viscous mixture including fragments of edible solid material to regions adjacents the central voids of the disc-like bodies as the bodies are advanced by the conveyor, successively severing predetermined quantities of the mixture from the supply by a sharp instrumentality, and moving the severed quantities of the mixture by the instrumentality into the central voids in the disc-like bodies.

4,100,305

METHOD OF MAKING AN IMPROVED COFFEE VOLATILES CONCENTRATE

Richard Gregg, Greenhills, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 5, 1976, Ser. No. 655,608
Int. Cl.[2] A23C *1/06*
U.S. Cl. 426—385 8 Claims

1. A method for preparing a coffee volatiles concentrate from roast and ground coffee comprising the steps of:

(a) uniformly wetting a roast and ground coffee with from about 0.1 to about 0.9 parts water per part of roast and ground coffee, said water being at a temperature of from about 32° F to about 110° F while said coffee is in a turbulent state of fluidization;

(b) contacting said roast and ground coffee, while maintaining the coffee in a state of fluidization, with from about 0.005 to about 0.05 parts of cool steam, per part of roast and ground coffee, thereby to provide volatiles-laden steam and devolatilized roast and ground coffee, said contact being conducted under an absolute pressure of from about 5 to about 100 mm of mercury, the steam having a temperature of from about 32° F to about 110° F, said roast and ground coffee making contact with said steam for about 0.1 to about 45 minutes;

(c) collecting the volatiles-laden steam as a frost by condensation at a temperature of from about −100° F to about −320° F and at an absolute pressure of from about 0 to about 80 mm of mercury;

(d) melting the frost to form a coffee volatiles concentrate by contacting the frost with at least an equal weight of an aqueous coffee extract having a solids content of from about 25% to about 65%; and

wherein said fluidization is mechanically induced under high vacuum within a horizontal mixing shell, by mixing tools which rotate within said shell at high speeds sufficient to impart rapid but gentle motion to the fragile particles of said roast and ground coffee; said mixing tools being so designed such as to lift said fragile particles from the walls of said shell, so that rapid mixing occurs without substantial adverse effect to said fragile particles.

4,100,306

METHOD OF MAKING AN IMPROVED INSTANT COFFEE

Richard Gregg, Greenhills; James A. Weikel, Forest Park; Jayantilal M. Patel, Fairfield, and Richard F. Durchholz, Loveland, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 5, 1976, Ser. No. 655,607
Int. Cl.[2] A23F *1/08*
U.S. Cl. 426—386 14 Claims

1. A method for preparing a soluble instant coffee composition from roast and ground coffee comprising the steps of:

(a) uniformly wetting a semi-bed of roast and ground coffee while the coffee is in a state of mechanical fluidization, with from about 0.1 to about 0.9 parts water per part of roast and ground coffee, said water being at a temperature of from about 32° F. to about 110° F., said roast and ground coffee having a particle size of from about 5 to about 800 microns;

(b) contacting the mechanically fluidized roast and ground coffee with from about 0.005 to about 0.05 parts steam, per part of roast and ground coffee, thereby to provide volatiles-laden steam and devolatilized roast and ground coffee, said contact being conducted under an absolute pressure of from about 5 to about 100 mm of mercury, the steam having a temperature of from about 32° F. to about 110° F., said roast and ground coffee making contact with said steam for about 0.1 to about 45 minutes;

(c) collecting the volatiles-laden steam as a frost by condensation at a temperature of from about −100° F. to about −320° F. and at an absolute pressure of from about 4 to about 80 mm of mercury;

(d) melting the frost to form a volatiles-laden extract by contacting the frost with at least an equal weight of an aqueous coffee extract having a solids content of from about 25% to about 65%;

(e) forming an aqueous slurry of the devolatilized roast and ground coffee and from about 2 parts to about 10 parts of water by dry weight of coffee, said slurry having a temperature of from about 80° F. to about 200° F., and gently agitating the slurry with a low shear agitation system so as to provide a substantially uniform suspension and an extract having a soluble coffee solids content of about 4% to about 15%, and wherein said soluble coffee solids are about 18% to about 27% of said roast and ground coffee on a dry weight basis, said low shear agitation system maintaining a substantially emulsion-free slurry, separating the aqueous extract from released coffee oil and extracted coffee grounds; and

(f) drying the aqueous extracts of steps (d) and (e) to dry and soluble coffee powders; and

(g) combining said powders to provide said instant coffee composition.

4,100,307

DEVICE FOR PRODUCING A PIPE JOINT HAVING AN INTERNAL GROOVE THEREIN

Teryoshi Asano, Kawagoe, Japan, assignor to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 642,632, Dec. 19, 1975, abandoned.
This application Dec. 6, 1977, Ser. No. 857,945
Claims priority, application Japan, Dec. 19, 1974, 49/146369
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—533 4 Claims

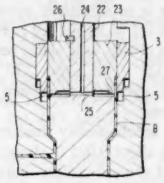
1. An apparatus for forming a resin pipe joint having a groove on the internal surface thereof, comprising:

(a) an internal core comprising, a main core body, a projection positioned to define fluid opendings between the base of said main core body and said projection, an auxiliary core member slidable axially on said projection between at least a first position in which said auxiliary core tightly contacts the base of said main core body and a second position which defines an annular gap between said main

core body and said auxiliary core member, said gap communicating with said fluid openings, and a fluid passage in said internal core communicating with said fluid openings;

(b) an outer mold surrounding said internal core;

(c) a sleeve slidable axially on said auxiliary core and within said outer mold from a first position to a second position, said auxiliary core, said outer mold and said sleeve defining a cylindrical resin receiving space when said sleeve is in said first position and defining said cylindrical resin receiving space plus an additional bulge receiving space communicating with said cylindrical resin receiving space when said sleeve is in said second position;



(d) means for introducing resin into said cylindrical resin receiving space when said sleeve and said auxiliary core members are in their respective first positions to form a resin pipe structure;

(e) means for moving said auxiliary core member and sleeve between their respective first and second positions; and

(f) means for introducing fluid under pressure into said fluid passage at least when said sleeve and said auxiliary core members are in their respective second positions to cause said fluid to pass through said fluid openings and said annular gap and pressurize a portion of said resin pipe structure into said bulge receiving space.

4,100,308

PIZZA-LIKE SNACK FOOD DRY MIX AND PROCESS FOR MAKING SAME

Ilija Gawrilow, Strongsville, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 618,669, Oct. 1, 1975, abandoned. This application Jul. 19, 1976, Ser. No. 706,710

Int. Cl.[2] A21D *10/00, 10/04*

U.S. Cl. 426—554 **10 Claims**

1. Dry mix adapted for hydration with water to provide a pourable batter which when poured onto a horizontal surface and baked has a chewyness, toughness and crispness resembling traditional yeast-leavened pizza crust consisting essentially of: 65 to 80% flour, 0.5 to 4% chemical leavening agent, 0 to 4% salt, 2 to 7% of solids selected from whey or milk solids, 12 to 22% of sweetener, 0.5 to 5% of fat, 0.5 to 3% of soy flour, 0.5 to 3.5% of powdered egg whites, and 0 to 1% of flavoring agent, wherein said percentages are based on the weight of the mix; said flour being wheat bread flour having a protein content by weight in the range of about 11.5–13.5%.

4,100,309

COATED SUBSTRATE HAVING A LOW COEFFICIENT OF FRICTION HYDROPHILIC COATING AND A METHOD OF MAKING THE SAME

Michael J. Micklus, Somerville, and David T. Ou-Yang, Raritan, both of N.J., assignors to Biosearch Medical Products, Inc., Raritan, N.J.

Filed Aug. 8, 1977, Ser. No. 822,412

Int. Cl.[2] A61M *23/00*

U.S. Cl. 427—2 **8 Claims**

1. The method of placing on a substrate a hydrophilic coating which has a low coefficient of friction when wetted with a water based liquid comprising:

applying to the substrate a solution having from about 0.4% to about 5% (weight to volume). polyisocyanate and from about 0.3% to about 10% (weight to volume). polyurethane,

evaporating the solvent,

applying a solution having from about 0.5% to about 10% (weight to volume). polyvinylpyrollidone to the thus treated substrate and then evaporating the solvent of the last mentioned solution to form a polyvinyl pyrollidone-polyurethane interpolymer.

4,100,310

METHOD OF DOPING INPURITIES

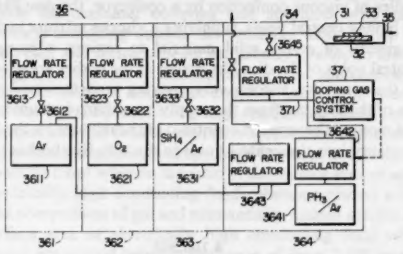
Mitsuru Ura; Takuzo Ogawa; Takaya Suzuki, all of Hitachi; Yosuke Inoue, Tokai, and Masayoshi Nomura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 14, 1976, Ser. No. 648,943

Claims priority, application Japan, Jan. 20, 1975, 50/7754

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—8 **14 Claims**



1. In a method of doping an impurity wherein carrier gas from a carrier gas flow path, a semiconductor compound gas from a semiconductor compound gas flow path and a doping gas containing an impurity from a doping gas flow path are mixed up and led to a reaction chamber maintained at a high temperature to form a semiconductor layer doped with a predetermined impurity concentration on a substrate disposed within the reaction chamber, the improvement comprising the steps of picking up a part of said doping gas in said doping gas flow path prior to mixing of said doping gas with said semiconductor compound gas and said carrier gas and leading the part to a gas analyzer, monitoring the impurity concentration in said doping gas, and controlling the impurity concentration in said doping gas to a predetermined value sufficient to produce said semiconductor layer having said predetermined concentration.

4,100,311

PROCESS FOR CURING OF ADHESIVES FOR FLOCKING AND TEXTURING ON HEAT-SENSITIVE SUBSTRATES, BY ELECTRON-BEAM RADIATION

Samuel V. Nablo, Lexington, and Alfred D. Fussa, Needham Heights, both of Mass., assignors to Energy Sciences Inc., Bedford, Mass.

Continuation of Ser. No. 468,818, May 10, 1974, abandoned. This application Jun. 21, 1976, Ser. No. 698,025

Int. Cl.[2] B05D *1/14, 1/16*

U.S. Cl. 427—44 **6 Claims**

1. A process for curing the adhesive used to hold flock fiber texturing material and the like to a heat-sensitive substrate selected from the group consisting of temperature-sensitive plastics, natural fibers, wood, paper and paper-foil laminates that inherently limits the degree of thermal curing that may be employed and consequently the speed of curing, that comprises, applying an electron-curable adhesive layer of a thickness of the order of a few mils to a heatsensitive substrate, attaching a layer of said texturing material to the adhesive layer with the fibers substantially perpendicular to the layer and with the texturing material layer being of a thickness two

to fifty times that of the adhesive layer, passing the assembly of substrate and adhesively secured material transversely past a predetermined elongated region extending over the coextensive width of the substrate, the adhesive layer, and the texturing material, directing unscanned electron curtain beam energy at said predetermined region upon the material at said region simultaneously throughout said region in a direction substantially parallel to the fibers throughout said region, and through the material and upon the adhesive layer substantially perpendicularly thereto throughout said region, adjusting the electron beam to produce an electron dose of the order of 2 megarads ±50% delivered to said adhesive layer throughout said region, of energy of the order of 150 keV ±30% throughout said region, and with a line speed of passing the predetermined region of the order of about 20–80 meters per minute, in order to cure the adhesive without affecting the heat-sensitive substrate.

4,100,312

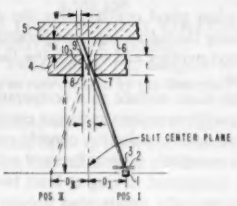
METHOD OF MAKING METAL-PLASTIC LAMINATES

Michael S. Lombardo, Waterbury; Elaine F. Jacovich, Cheshire; Eugene D. D'Ottavio, Thomaston, and John J. Grunwald, New Haven, all of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Continuation of Ser. No. 629,911, Nov. 7, 1975, abandoned, which is a continuation of Ser. No. 303,369, Nov. 3, 1972, abandoned. This application Dec. 2, 1976, Ser. No. 747,071

Int. Cl.[2] B05D *5/12;* **B32B** *15/08*

U.S. Cl. 427—96 **11 Claims**



1. The method of producing a final laminate of a self-supported plastic substrate and a permanent metal film covering at least a part of the surface of said substrate, which comprises the steps of forming an initial laminate of the plastic substrate and a sacrificial, temporarily applied, anodized aluminum foil, wherein the interface between such aluminum foil and substrate is treated prior to lamination to provide an organic silicon compound at such interface, said silicon compound being a silane of the general formula $R \cdot Si(R_1)_3$, wherein R is a lower alkyl amino substituted radical and R_1 is a lower alkanoxy radical, then bonding said substrate and aluminum foil together under heat and pressure to form said initial laminate, chemically stripping said aluminum foil from the initial laminate thus formed, and then metallizing at least a part of the stripped surface of the substrate to provide said final laminate.

4,100,313

PROCESS FOR FORMING AN OPTICAL WAVEGUIDE

Jacob Meyer Hammer, Trenton, N.J., and Clyde Carl Neil, Levittown, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 625,885

Int. Cl.[2] B05D *5/06;* **C23C** *11/08*

U.S. Cl. 427—162 **4 Claims**

1. A process for forming an optical waveguide which comprises:

(a) positioning an evaporator source for material to be deposited and a substrate upon which material is to be deposited on opposite sides of a mask wherein

(i) said material is selected from the group consisting of niobium, titanium, vanadium, chromium, manganese, iron, nickel and cobalt;

(ii) said substrate is selected from the group consisting of lithium tantalate and lithium niobate,

(iii) said mask has a slit with a width larger than the width of the stripe to be deposited and being thick relative to the width of said slit, and

(iv) said evaporator source is at a small acute angle relative to said slit whereby a shadowing effect reduces the effective width of said slit;

(b) evaporatively depositing material through said slit to produce a stripe of desired width; and

(c) diffusing the deposited material into the substrate whereby an optical waveguide is formed.

4,100,314

METHOD FOR INCREASING THE STRENGTH AND DENSITY OF CARBONACEOUS PRODUCTS

Rudolph W. Wallouch, Lewiston, N.Y., assignor to Airco, Inc., Montvale, N.J.

Filed Mar. 29, 1977, Ser. No. 782,598

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—228 **10 Claims**

1. A method for increasing density and strength in a baked carbonaceous body, comprising: impregnating said body with a tarry hydrocarbon composition; coating said impregnated body with a thermosetting polymerizable composition, and at least partially curing said latter composition to provide an encasing shell of polymeric material about said body that is mechanically stable during a subsequent baking step to temperatures above the softening and free flowing temperatures for said impregnating composition; and thereafter baking said shell-encased body to effect carbonization of the impregnated and the encasing compositions.

4,100,315

PROCESS FOR LACQUERING METALS

Horst Lauterbach, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,540

Claims priority, application Switzerland, Apr. 13, 1976, 4672/76; Aug. 20, 1976, 10614/76

Int. Cl.[2] B05D *1/38*

U.S. Cl. 427—379 **8 Claims**

1. A process for the production of an adhesive, non-porous film lacquer on a metal surface which comprises applying to a metal surface an aqueous composition suspension comprising a solid thermosetting synthetic resin having an average granular size between 0.1 and 10 μm and a wetting agent selected from the group consisting of an alkylphenyloxethylate in which the oxethylate has a molecular weight of about 1700, and the alkyl moiety contains 8–12 carbon atoms, and an amino coconut fatty acid oxethylate wherein the oxethylate group which has a molecular weight between about 90 and 440 is bonded to the amino group; drying; and curing said composition.

4,100,316

FORM FOR DECORATIVE WREATH

Laurie M. Lackey, 6825 Beechtree La., Falls Church, Va. 22042

Filed Jul. 14, 1977, Ser. No. 815,643

Int. Cl.[2] A41G *1/00*

U.S. Cl. 428—10 **2 Claims**

1. A composite form for decorative wreaths comprising

a first annular disc member having a surface whose coefficient of friction is sufficient to inhibit the movement of twigs and branches held thereagainst,

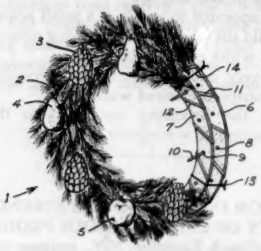
a second annular disc member having a surface similar to said first annular disc member,

said second disc member being narrower than said first disc member,

a first elastic band spirally wound about the surface of said first disc member, whereby evergreen branches and

sprigs may be inserted between the elastic band and surface of the disc member,

a second elastic band spirally wound about the surface of said second disc-member, whereby evergreen branches and sprigs may be inserted between the elastic band and surface of the disc member; and



means for fastening together said first and second disc members in a superposed concentric relationship,

whereby more and larger evergreen branches may be added and held between the superposed disc members to produce a composite wreath having a thicker and fuller appearance as compared to the individual disc members.

4,100,317

METAL LEAF

Hiroshi Narui; Ikuo Akune, and Yosiya Kobiki, all of Kyoto, Japan, assignors to Oike & Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 351,952, Apr. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 190,907, Oct. 20, 1971, abandoned. This application May 19, 1975, Ser. No. 578,817

Claims priority, application Japan, Oct. 23, 1970, 45-93740

Int. Cl.² B32B *3/24, 15/08*

U.S. Cl. 428—137 **2 Claims**

1. A metal leaf having a critical self-supportability consisting of

(1) a resinous base layer having a thickness of 0.35 to 1 μ and made of at least one resin selected from the group consisting of acrylic resin, vinyl chloride-vinyl acetate copolymer, polyvinyl butyral, polycarbonate, rosin-modified maleic resin, resol-type or novolak-type phenolic resin, urea resin, melamine resin, nitrocellulose, cellulose acetate, alkyd resin, urethane resin, rosin and shellac,

(2) a vacuum-metallized intermediate metal deposition layer a metal selected from the group consisting of gold, silver, aluminum and copper, having a thickness of 0.03 to 0.1 μ, and

(3) a resinous top layer having a thickness of 0.35 to 1 μ and made of at least one resin selected from the group consisting of acrylic resin, vinyl chloride-vinyl acetate copolymer, polyvinyl butyral, polycarbonate, rosin-modified maleic resin, resol-type or novolak-type phenolic resin, urea resin, melamine resin, nitrocellulose, cellulose acetate, alkyd resin, urethane resin, rosin and shellac; layers (1), (2) and (3) having a thickness of 0.73 to 2.1 μ and a tensile strength of 0.01 to 1.4 kg./mm^2.

4,100,318

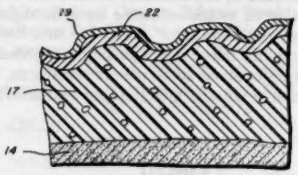
ACTINIC RADIATION CURED COATING FOR CUSHIONED SHEET GOODS AND METHOD

Thomas J. McCann, Hollywood, and Ernest E. Regan, Ft. Lauderdale, both of Fla., assignors to Dowdflor Corporation, Miami, Fla.

Filed Dec. 27, 1976, Ser. No. 754,431

Int. Cl.² B05D *3/06*

U.S. Cl. 428—159 **38 Claims**



1. A process for producing a cushioned sheet goods product comprising the steps of:

coating a substrate with a flexible foamable vinyl composition and heating to gel the foamable composition,

applying a decorative pattern to the surface of the gelled coating,

coating a clear vinyl overlay over the decorative pattern, and passing through a high temperature oven to fuse the clear vinyl overlay and expand the foam to the required thickness,

cooling the sheet surface to a temperature which permits bonding with an actinic radiation curable coating,

applying an actinic radiation curable coating composition which is essentially solvent free and comprises at least one organic compound having at least two photopolymerizable ethylenically unsaturated groups per molecule and capable of curing upon exposure to actinic radiation to form a continuous coating,

exposing the thus coated sheet to actinic radiation until such coating has set,

thereby achieving physical properties of the actinic radiation cured coating falling within the following range;

Tensile Stength PSI: 2,000–4,000
Elongation %: Greater Than 15
Young's Modulus: 30,000–90,000

whereby the stain resistance, scratch and scuff resistance, abrasion resistance and gloss retention properties are enhanced by adding the actinic radiation curable coating.

26. A cushioned sheet goods comprising, in combination,

a flexible substrate,

a flexible foamable vinyl composition positioned atop the substrate and foamed,

a decorative pattern over the surface of the flexible foamed vinyl composition,

a clear vinyl overlay over the decorative pattern,

and a cured coating which is essentially solvent free and having at least one organic compound having at least two photo-polymerizable ethylenically unsaturated groups per molecule which is fully set,

wherein the physical properties of the cured coating fall within the following range:

Tensile Strength PSI: 2,000–4,000
Elongation %: Greater Than 15
Young's Modulus: 30,000–90,000

4,100,319

STABILIZED NONWOVEN WEB

Robert J. Schwartz, Winneconne, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 595,701, Jul. 14, 1975, abandoned. This application Apr. 28, 1977, Ser. No. 791,832
Int. Cl.[2] D04H 1/58
U.S. Cl. 428—171 3 Claims

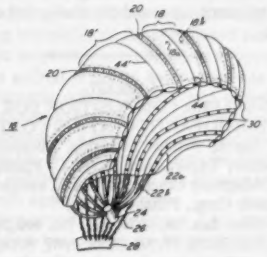
1. A nonwoven continuous filament web of polypropylene filaments having a basis weight of about 1-3 oz./yd.[2], a surface abrasion resistance on both sides thereof of at least about 20, and basis weight normalized grab tensile strength of at least about 20 lbs./(oz./yd.[2]), said web being further characterized by the presence of intermittent compressed autogenous bond regions of a size and density to provide textile-like qualities which extend through the thickness of the web with the filaments on both outer surfaces of the bond regions being substantially fused to give a film-like appearance and with the filaments within the interior of the web between both said outer fused surfaces of the bond regions being deformed without substantial fusion to provide delamination resistance.

4,100,320

CUSTOM FITTED, LIGHT WEIGHT, AIR CONDITIONED PROTECTIVE HELMET

Gloria T. Chisum, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 463,944, Apr. 25, 1974, Pat. No. 3,956,773. This application Mar. 1, 1976, Ser. No. 662,475
Int. Cl.[2] B32B 3/20, 3/00
U.S. Cl. 428—188 9 Claims



9. A liner comprising:

a flexible sheet;

a plurality of elongated flexible cells attached side by side to said sheet, each cell forming a pair of chambers separated by a severable partition, and said chambers of said pairs respectively containing first and second components combinable to produce a foam substance;

a plurality of ventilating air ducts, each duct interposed between adjacent cells; and

severing means for removing the partition separating the two chambers, said means including paddles spanning each of said partitions at one end, and first and second strings movable within respective ones of said pairs of chambers and connected to respective ends of said paddles, said first and second strings extending from said paddles to the other end of said partitions.

4,100,321

POWDERED TONOR IMAGE CONTAINING ARTICLE

Sheldon Irwin Schlesinger, East Windsor Township, Mercer County, and Ronald J. Boszak, Trenton, both of N.J., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 486,169, Jul. 5, 1974, Pat. No. 3,997,344. This application May 26, 1976, Ser. No. 690,307
Int. Cl.[2] B32B 7/10, 3/00
U.S. Cl. 428—207 10 Claims

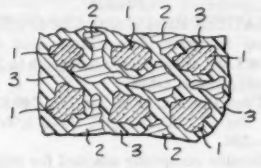
1. As an article of manufacture, a composite sheet comprising a support; and, in surface contact therewith, (1) a radiation-responsive non-exposed layer portion over part of the surface of said support containing in admixture a polymer selected from the group consisting of (a) copolymers of glycidyl acrylate and allyl glycidyl ether and (b) terpolymers of glycidyl acrylate, glycidyl methacrylate and allyl glycidyl ether containing up to about 0.25 mole of glycidyl methacrylate per mole of glycidyl acrylate, and, as a latent curing catalyst, an aromatic diazonium salt of a complex halogenide, said non-exposed layer being imbibed in its surface, a powdered toner applied while said mixture is in a tacky state and (2) an exposed, polymerized, cured insoluble layer portion over part of the surface of said support, said insoluble layer portion being comprised of the photopolymerization product derived from irradiation of a polymer selected from the group consisting of (a) copolymers of glycidyl acrylate and allyl glycidyl ether and (b) terpolymers of glycidyl acrylate, glycidyl methacrylate and allyl glycidyl ether containing up to about 0.25 mole of glycidyl methacrylate per mole of glycidyl acrylate in the presence of an aromatic diazonium salt of a complex halogenide which decomposed upon exposure to irradiation to release a Lewis Acid effective to initiate polymerization of said polymer; said copolymer and terpolymer in both layer portions having an inherent viscosity of from about 0.09 to 0.28 and an epoxide equivalent of at least about 0.64 per 100g. of polymer, being substantially non-tacky at room temperature, tacky at an elevated temperature and convertible to a non-tacky condition upon exposure to irradiation and said diazonium salt being present in sufficient amount to initiate said polymerization.

4,100,322

FIBER-RESIN-CARBON COMPOSITES AND METHOD OF FABRICATION

Robert W. Seibold, Santa Monica; Haig S. Parechanian, Fountain Valley; William T. Weatherill, La Palma, and Robert E. Lowe, Santa Ana, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 11, 1974, Ser. No. 531,662
Int. Cl.[2] B32B 7/00
U.S. Cl. 428—257 10 Claims



1. A plastic composite having improved elevated temperature strength and good thermal insulation properties, which comprises throughout said composite a mixture of carbon and resin matrices, and fibrous reinforcement, forming a bimatrix fibrous reinforcement-carbon-resin solid composite, said carbon of said bimatrix fibrous reinforcement-carbon-resin composite being mechanically locked and adhered to said fibrous reinforcement.

4,100,323

SCRIMLESS FILTER FELT

Herman Hans Forsten, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 681,580, Apr. 29, 1976, abandoned. This application Oct. 7, 1977, Ser. No. 840,361
Int. Cl.[2] D04H *1/08*
U.S. Cl. 428—280 4 Claims

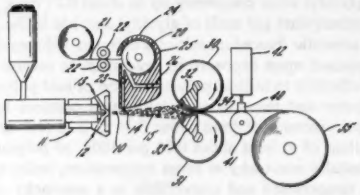
1. A needled, dimensionally stable, scrimless filter felt comprised of at least 80% by weight poly(m-phenylene isophthalamide) staple fibers having at least a low degree of crystallinity and a staple length of 4 to 16 cm., a felt density of 0.15 to 0.4 g./cm.^{3} and an air permeability of 3 to 30 m.^{3}/min./m.^{2} (0° C. basis, pressure differential = 1.27 g./cm.^{2}), said felt having been heated at 280–350° C under restraint for 1 to 900 seconds.

4,100,324

NONWOVEN FABRIC AND METHOD OF PRODUCING SAME

Richard A. Anderson, Menasha; Robert C. Sokolowski, and Kurt W. Ostermeier, both of Harrison, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 454,816, Mar. 26, 1974, abandoned. This application Jul. 19, 1976, Ser. No. 706,456
Int. Cl.[2] D04H *1/00*
U.S. Cl. 428—288 23 Claims



1. A nonwoven gas-formed fabric-like material having a unique combination of strength, absorbency and hand, said material consisting essentially of a gas-formed matrix of thermoplastic polymeric melt-blown microfibers having an average fiber diameter of less than about 10 microns, and a multiplicity of individualized and gas-formed wood pulp fibers disposed throughout said matrix of microfibers and engaging at least some of said microfibers to space the microfibers apart from each other, said wood pulp fibers being interconnected by and held captive within said matrix of microfibers by mechanical entanglement of said microfibers with said wood pulp fibers, the mechanical enganglement and interconnection of said microfibers and wood pulp fibers alone forming a coherent integrated fibrous structure.

4,100,325

WEATHER RESISTANT COMPOSITES

James William Summers, Bay Village, and George Joseph Kliner, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 13, 1976, Ser. No. 749,939
Int. Cl.[2] B32B *27/08;* B44D *1/44*
U.S. Cl. 428—334 18 Claims

1. A weatherable composite adapted for outdoor exposure comprising;

a. A capstock containing:

(1) vinyl chloride polymer having an inherent viscosity of from about 0.45 to about 1.2,

(2) at least 6 parts by weight of titanium dioxide per 100 parts by weight of vinyl chloride polymer,

(3) from about 10 to less than about 35 parts by weight of a plasticizer per 100 parts by weight of vinyl chloride polymer, and

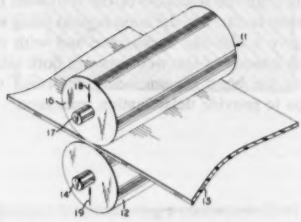
b. A substrate selected from the group consisting of rigid vinyl chloride polymers, chlorinated vinyl chloride polymers, and acrylonitrile-butadiene-styrene polymers.

4,100,326

METHOD FOR TREATING A MAGNETIC RECORDING MEDIUM

Masashi Somezawa; Shigetaka Higuchi, both of Sendai; Tatsuo Shimizu, and Isao Ishibashi, both of Tagajo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 439,231, Feb. 4, 1974, abandoned. This application Jul. 11, 1975, Ser. No. 595,086
Claims priority, application Japan, Feb. 3, 1973, 48-13968
Int. Cl.[2] H01F *10/02*
U.S. Cl. 427—130 6 Claims



1. A dry-calendering method of treating a magnetic tape formed of a flexible base of non-magnetic material supporting a magnetic layer containing finely-divided magnetic particles dispersed in a flexible binder to have low surface roughness and a high density of magnetic particles comprising the steps of passing said tape, in the absence of an introduced lubricant, between a metal roll and an elastic roll having a polyurethane cylindrical surface with a hardness of no less than approximately 70° measured in Shore D, the temperature of said metal roll being in the range of approximately 40° C. to approximately 200° C. at the cylindrical surface thereof, and the pressure between said rolls being in the range from approximately 50 Kg/cm to approximately 500 Kg/cm, the metal roll contacting said magnetic layer and the elastic roll contacting said flexible base.

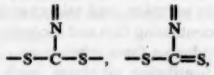
4,100,327

ORGANO-SULFUR COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Wilkins Township, Allegheny County; Joseph F. Meier, Export, and David C. Phillips, Penn Hills Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

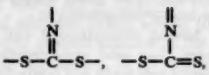
Filed Jun. 24, 1976, Ser. No. 699,561
Int. Cl.[2] B32B *27/38;* C08K *5/01, 5/06, 5/07*
U.S. Cl. 428—339 14 Claims

1. A composition comprising about 20 to about 250 phr of at least one non-metallic, non-ionic (covalent) organo-sulfur compound containing the group



or mixtures thereof, and a solution of a resinous carrier curable at room temperature and stable at 60° C, and unreactive with said organo-sulfur compound at its thermoparticulation temperature.

12. A thermoparticulating coating comprising a solid layer of a cured resinous carrier containing about 20 to about 250 phr of a non-metallic, non-ionic (covalent) organo-sulfur compound containing the group



or mixture thereof, said resinous carrier being curable and stable at 60° C, and unreactive with said organo-sulfur compound at its thermoparticulation temperature.

13. A coating according to claim 12 which is about 1/16 to about ¼ inches thick.

4,100,328

BINDER COMPOSITION AND PROCESS FOR PREPARING PRESSURE MOLDED CELLULOSIC ARTICLES

James A. Gallagher, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jun. 4, 1976, Ser. No. 695,902
Int. Cl.² B32B 5/16; C08L 1/00; B29J 5/04
U.S. Cl. 428—407 15 Claims

1. A molding composition suitable for forming a shaped article comprising wood particles having about 2 to about 20% by weight moisture based upon the dry weight of said wood particles and a binder composition capable of being crosslinked coated onto said wood particles and present in the proportion of about 0.5 to about 50% based upon the dry weight of said wood particles, said binder consisting essentially of the mixture of an organic polyisocyanate and 0.5 to about one equivalent weight of a polyether polyol based upon one equivalent weight of said organic polyisocyanate, said polyol having a functionality greater than 2 wherein said molding composition contains no catalyst and is used in the absence of a mold-release agent.

8. A particle board comprising comminuted wood particles, said particles having about 2 to 20% by weight moisture based upon the dry weight of said wood particles, and a binder coated onto said particles present in the proportion of about 0.5 to about 50% based upon the dry weight of said particles, said binder consisting essentially of the crosslinked reaction product of an organic polyisocyanate and 0.5 to about one equivalent weight of a polyether polyol based upon one equivalent weight of said organic polyisocyanate, said polyether polyol having a functionality greater than 2 and wherein said binder is utilized in the absence of a catalyst and a mold-release agent.

13. A process for molding wood particles into a discrete shaped product utilizing a binder in the absence of a catalyst and a mold-release agent comprising:

A. comminuting wood having about 2 to about 20% by weight moisture based upon the dry weight of said wood to provide a plurality of wood particles,

B. coating said particles with a binder mixture, said binder consisting essentially of an organic polyisocyanate having at least two active isocyanate groups per molecule and about 0.5 to about 1.0 equivalent weight of a polyether polyol based upon one equivalent weight of said organic polyisocyanate wherein said polyol is prepared by reacting a polyhydric alcohol having a functionality greater than 2 with an alkylene oxide and wherein said wood particles are coated with said binder in the proportion of about 0.5 to about 50% based upon the dry weight of said wood particles to form a blended material by spraying with said binder as said particles are tumbled or agitated,

C. forming said blended material into a loose mat or felt,

D. placing said mat in a heated press between polished metal plates, and

E. crosslinking said mat under conditions of heat and pressure.

4,100,329

DRAFTING FILM

William A. Neithardt, Jr., Ridgefield, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Feb. 12, 1976, Ser. No. 657,521
Int. Cl.² B32B 27/38
U.S. Cl. 428—413 6 Claims

1. Drafting sheet material comprising a sheet support having a coating thereon of a composition comprising finely-divided pigment dispersed throughout a binder matrix comprising a cross-polymerized reaction product of (a) an acrylic or methacrylic acid ester vinyl monomer and (b) a polyene/polythiol compound blend.

4,100,330

METHOD FOR COATING GLASS WITH SILICON AND A METAL OXIDE AND RESULTING PRODUCT

Harold E. Donley, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1977, Ser. No. 782,150
Int. Cl.² C03C 15/00
U.S. Cl. 428—429 9 Claims

1. A method for producing a coated glass article comprising the steps of:

a. maintaining a glass substrate at a temperature of at least about 400° C. in a non-oxidizing atmosphere;

b. contacting a surface of the glass substrate with a silane-containing gas for a sufficient time to form a silicon coating on the glass surface;

c. maintaining the silicon coated glass at a temperature of at least about 250° C. in an oxidizing atmosphere; and

d. contacting the silicon coated surface with a coating composition comprising a metal compound which, upon contact with the hot glass surface, thermally decomposes to form a metal oxide coating over the silicon coating on the glass surface.

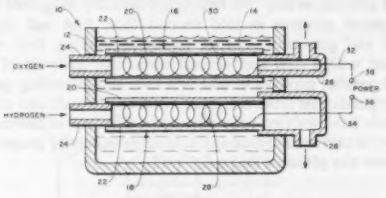
8. A coated article prepared according to the method of claim 1.

4,100,331

DUAL MEMBRANE, HOLLOW FIBER FUEL CELL AND METHOD OF OPERATING SAME

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of John D. Ingham, La Crescenta, and Daniel D. Lawson, Arcadia, both of Calif.

Filed Feb. 3, 1977, Ser. No. 765,138
Int. Cl.² H01M 4/86
U.S. Cl. 429—13 11 Claims



1. A gaseous fuel cell comprising in combination:

a cell enclosure containing a body of aqueous inorganic acid electrolyte;

a first, gas impermeable, ion-impermeable, tubular electrode formed of at least one fine, filamentary, perfluorosulfonic acid substituted polytetrafluoroethylene synthetic resin hollow fiber having ion-exchange functionality immersed in the body of electrolyte having a gas inlet and a gas outlet, a gas permeable layer of catalytic metal deposited only on the inside surface thereof and a first, high surface

area current collector in contact with the catalytic deposit;

a second, gas impermeable, ion-permeable, tubular counter-electrode formed of at least one fine, filamentary, perfluorosulfonic acid substituted polytetrafluoroethylene synthetic resin, hollow fiber having ion-exchange functionality immersed in the body of electrolyte having a gas inlet and a gas outlet, a gas permeable layer of catalytic metal deposited on the inside surface thereof and a second high surface area current collector in contact with the catalytic deposit;

means for supplying a fuel gas to one of said inlets;

means for supplying a gaseous oxidant to the other of said inlets; and

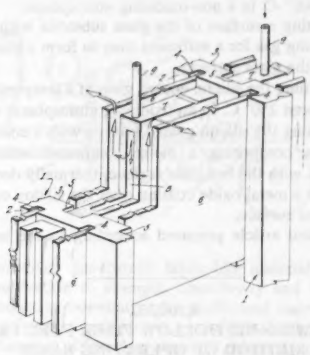
means connected to said first and second current collectors for extracting electrical energy from the cell.

4,100,332

COMB TYPE BIPOLAR ELECTRODE ELEMENTS AND BATTERY STACKS THEREOF

Peter Carr, Utica, Mich., assignor to Energy Development Associates, Madison Heights, Mich.

Filed Feb. 22, 1977, Ser. No. 770,725
Int. Cl.[2] H01M *4/06*
U.S. Cl. 429—27 **18 Claims**



1. An improved bipolar electrode for increasing the effective intercell distance as opposed to the actual distance between opposing electrode faces wherein the improvement comprises a comb type element comprising an electrically conductive, chemically inert, generally flat wall having first and second opposing faces, each of said first and second faces having a plurality of spaced, substantially parallel grooves therein, said spaced grooves in said first face being laterally staggered from said spaced grooves in said second face; first and second spaced and generally parallel electrodes having first edges disposed within first and second respective grooves of said spaced parallel grooves in said first face and extending generally perpendicular from the plane of said inert wall; and a third electrode having a first edge disposed within one of the spaced grooves in said second face and extending generally perpendicular from the plane of said inert wall.

4,100,333

BATTERY STRUCTURE

Ronald J. Haas, San Jose, and Donald D. Briggs, Mountain View, both of Calif., assignors to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed May 4, 1977, Ser. No. 793,907
Int. Cl.[2] H01M *6/42*
U.S. Cl. 429—156 **3 Claims**

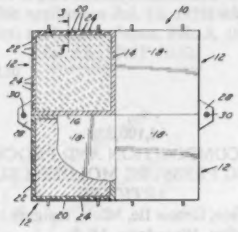
1. A battery structure which comprises:

a plurality of cells;

each cell having a plurality of nonstrengthened cell walls, such nonstrengthened cell walls contacting other nonstrengthened cell walls of other adjacent cells when said cells are in an assembled condition;

each cell also having strengthened cell walls having a strength greater than said nonstrengthened cell walls, such strengthened cell walls not contacting any cell walls of other cells when said cells are in an assembled condition;

a pair of structurally strengthened end plates located at



opposite ends of said cells when said cells are in an assembled condition, said end plates providing support for any nonstrengthened cell walls of said cells coming in contact therewith; and

means for holding said cells and said structurally strengthened end plates in an assembled condition, whereby said nonstrengthened cell walls are supported by one another or by said structurally strengthened end plates and said strengthened cell walls of said cells are exposed and not supported by a contacting cell wall.

4,100,334

PROCESS FOR RENDERING POLYMERS DEGRADABLE AND POLYMERS OBTAINED THEREBY

Nicola Palladino, Monterotondo; Marcello Mazzei, Milan, and Walter Marconi, San Donato Milanese, all of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 441,166, Feb. 11, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 644,889
Claims priority, application Italy, Jan. 15, 1973, 19199 A/73
Int. Cl.[2] C08J *3/20*
U.S. Cl. 526—1 **2 Claims**

1. A process for rendering a thermoplastic, film forming polymeric material adapted for use in packaging, degradable through the direct action of sunlight, said process consisting in adding to said polymeric material from 0.1 to 3% by weight of a compound selected from the group consisting of:

(1) 1,6-diphenylhexatriene;

(2) octa-2,4,6-triene;

(3) 2-methyl-1-3,5-hexatriene; and

(4) 2,6-dimethyl-2,4,6-octatriene.

4,100,335

FINELY DIVIDED SAPONIFIED ETHYLENE-VINYL ACETATE INTERPOLYMERS

Dorothee M. McClain, Cincinnati, Ohio, and Betty L. Vest, Covington, Ky., assignors to National Distillers and Chemical Corp., New York, N.Y.

Continuation of Ser. No. 564,198, Apr. 1, 1975, abandoned. This application Sep. 9, 1976, Ser. No. 721,743
Int. Cl.[2] C08F *8/12*
U.S. Cl. 526—10 **9 Claims**

1. A process for the simultaneous saponification and dispersion of an ethylene-vinyl acetate interpolymer into a finely divided form which consists essentially of subjecting a mixture of said interpolymer in molten form and water to vigorous agitation at a temperature below the degradation temperature of said interpolymer in the presence of from 0.5 to 25 parts by weight per 100 parts of interpolymer of a water-soluble block

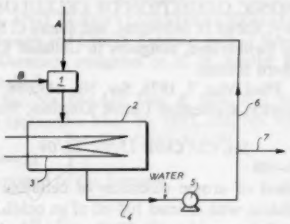
copolymer of ethylene oxide and propylene oxide having a molecular weight above about 3500 and containing at least 50% by weight of ethylene oxide, and in the presence of at least a stoichiometric amount relative to the amount of vinyl acetate units to be saponified, of an organic nitrogen base saponifying agent; cooling the resulting dispersion to below the softening temperature of the resulting saponified interpolymer; and recovering a finely divided dispersion of said interpolymer in which the particles are substantially spherical in shape, exhibit a number average particle size below about 10 microns and are substantially devoid of particles in excess of about 25 microns in diameter.

4,100,336

METHOD FOR THE CONTINUOUS MANUFACTURE OF HYDROCARBON RESINS

Emile Yax, Forbach, and Aurélien Abad, Sarreguemines, both of France, assignors to Societe Chimique des Charbonnages, Courbevoie, France

Filed Mar. 16, 1977, Ser. No. 778,300
Claims priority, application France, Mar. 16, 1976, 76 07564
Int. Cl.² C08F *4/14, 32/06, 32/08, 12/06*
U.S. Cl. 526—67 **9 Claims**



1. In the method for the continuous manufacture of hydrocarbon resins, starting from polymerizable unsaturated hydrocarbons, with controlling of the temperature of the polymerization reaction conducted in the presence as catalyst of a Lewis acid, and comprising the steps of:

forming a mixture of the catalyst and of the hydrocarbon fraction to be polymerized with a view to polymerize said mixture in a reactor, said mixture containing by weight from 0.05 to 0.8 part of catalyst for 100 parts of hydrocarbons; diluting and dispersing said mixture homogeneously by means of, and in, a portion of stream of medium issuing from the reactor in the proportion of from 60 to 300 parts by volume of said stream for one part by volume of the hydrocarbon fraction to be polymerized; said polymerization being carried out in the presence of water; and drawing off the remaining portion of the medium issuing from the reactor so as to isolate the resin obtained therefrom, the improvement wherein

the starting feed comprises 20–70% of polymerizable hydrocarbons consisting essentially of aromatic hydrocarbons with at least one unsaturated acyclic lateral chain or an unsaturated cyclic chain and poly-unsaturated cyclic hydrocarbons, the catalyst comprises boron trifluoride, the amount of water added is up to 2.2 moles per mole of catalyst, and the temperature of the reaction medium is maintained constant between 30° and 120° C for a dwell time of from 10 to 60 minutes, whereby there is selectively obtained a wide range of clear resins having viscosities above 1 poise at 25° C and softening points (KS) of less than 150° C.

4,100,337

OLEFIN POLYMERIZATION PROCESS AND CATALYST THEREFOR

Allen Noshay, East Brunswick, and Frederick John Karol, Belle Mead, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 700,843, Jun. 29, 1976. This application Aug. 11, 1977, Ser. No. 823,749
Int. Cl.² C08F *4/78, 10/00, 10/02*
U.S. Cl. 526—130 **4 Claims**

1. In a process for catalytically polymerizing ethylene alone or with one or more alpha-olefins, the improvement which comprises employing as the catalyst means a composition comprising at least one organo-chromium compound having the structure:

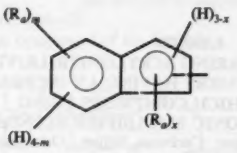
$$Ar_1 - Cr\ (II) - Ar_1$$

wherein Ar_1 is a monovalent radical selected from the group consisting of:

(1) cyclopentadienyl radicals having the structure

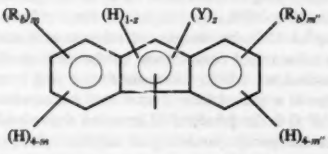
wherein R is a hydrocarbon radical having 1 to about 20 carbon atoms and n is an integer having values of 0 to 5;

(2) indenyl radicals having the structure:



wherein each R_a is a hydrocarbon radical having 1 to 10 carbon atoms, m is an integer having values of 0 to 4, and x is an integer having values of 0 to 3; and

(3) fluorenyl radicals having the structure:



wherein each of R_b is a hydrocarbon radical having 1 to 10 carbon atoms, each of m and m'' is an integer having values of 0 to 4, Y is H or R_b and z is an integer having values of 0 to 1; deposited on a silica support fluorided with less than 10% by weight of a fluoridation agent, based on the weight of said support, at a temperature of about 100° C. to about 400° C.

4,100,338

PROCESS FOR PREPARING SOLID POLYMERS OF NORBORNADIENE

George Suld, Springfield; Abraham Schneider, Overbrook Hills, and Harry K. Myers, Jr., Aston, all of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Aug. 31, 1977, Ser. No. 829,313

Int. Cl.[2] C08F *4/70, 32/06*

U.S. Cl. 526—142 11 Claims

1. Process for preparing solid polymer of norbornadiene comprising:

(a) contacting norbornadiene in the presence of a catalytic amount of a homogeneous catalytic system of nickel acetylacetonate or a nickel-phosphine complex selected from the group consisting of nickel dihalide bis(tributylphosphine); nickel dihalide bis(tricyclohexylphosphine); nickel dihalide bis(triphenylphosphine); isopropyl triphenyl phosphonium nickel dihalide bromide triphenylphosphine; nickel dicarbonyl bis(triphenylphosphine); nickel dibromide bis(trisphenylphosphine); nickel acetylacetonate hydrate-1,2 bisdiphenylphosphino ethane and wherein the halide is selected from the group consisting of fluoride, chloride and bromide; and an alkyl aluminum chloride selected from the group consisting of diethyl aluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride;

(b) having the contacting occurring at a temperature within the range between from about −40° C to about 120° C; and

(c) continuing the contacting until the solid polymer of norbornadiene is prepared.

4,100,339

PROCESS FOR PREPARING ACRYLONITRILE/VINYL CHLORIDE COPOLYMERS HAVING AN INCREASED VISCOSITY WHICH COMPRISES USING ANIONIC/NON-IONIC EMULSIFIER BLENDS

Joachim König, Schildgen; Carlhans Süling, Odenthal, and Günther Boehmke, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany.

Filed Feb. 3, 1977, Ser. No. 765,307

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1976, 2604630

Int. Cl.[2] C08F *214/06*

U.S. Cl. 526—193 7 Claims

1. A process for the preparation of chemically uniform copolymers having increased viscosity and increased molecular weight, comprising of from 20 to 50%, by weight, of acrylonitrile, from 80 to 50%, by weight, of vinyl chloride and, optionally, up to 15%, by weight, of other copolymerisable ethylenically unsaturated compounds, by the method of emulsion polymerisation which comprises carrying out the polymerisation at a pH of from 2 to 6 and a temperature of from 10° to 50° C in the presence of an anion active emulsifier selected from the group consisting of sulphuric acid derivatives, sulphonic acids, phosphoric acid derivatives and phosphonic acids and a non-ionic polyglycol ether emulsifier, such that:

(a) the total amount of anion active and of non-ionic emulsifier is from 0.75 to 8%, by weight, based on the total quantity of monomer, and

(b) the ratio, by weight, of anion active to non-ionic emulsifier is from 10:1 to 1.5:1.

4,100,340

COPOLYMERS CONTAINING PERFLUOROALKYL GROUPS

Karl Waldmann, Bad Soden am Taunus, and Gunter Schnabel, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,537

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1976, 2609462

Int. Cl.[2] C08F *214/08*

U.S. Cl. 526—245 6 Claims

1. Copolymers of

(A) perfluoroalkylethyl acrylate
$C_nF_{2n+1}CH_2CH_2OCOCH{=}CH_2$

(B) higher alkyl acrylate
$C_mH_{2m+1}OCOCH{=}CH_2$

(C) vinylidene chloride $CH_2 = CCl_2$

(D) acroylbutylurethane
$CH_2{=}CH{-}CONHCOOC_4H_9$

at the weight ratio of
1(A) : 0.22-0.39(B) : 0.45-0.85(C)-0.01-0.15(D)

n being 6, 8, 10, 12 or 14 and *m* being a number from 10 to 16.

4,100,341

URONIC OXIDATION OF CELLULOSE

Marcel Brasey; Alfred D. Schweizer, and James C. Shorrock, all of Geneva, Switzerland, assignors to Gallaher Limited, Belfast, Northern Ireland

Filed Mar. 7, 1974, Ser. No. 449,058

Claims priority, application United Kingdom, Mar. 29, 1973, 15188/73

Int. Cl.[2] C08B *15/02, 15/04*

U.S. Cl. 536—56 11 Claims

1. A method of uronic oxidation of cellulose comprising reacting cellulose with at least 100 ml of an oxidizing reactant per 40g of cellulose, said oxidizing reactant selected from the group consisting of

(a) aqueous nitric acid at a concentration of between 35 and 55% containing between 5g and 50g of nitrogen dioxide per 100 ml of aqueous nitric acid; and,

(b) aqueous nitric acid at a concentration of between 60 and 75%, containing between 5g and 30g of nitrogen dioxide per 100 ml of aqueous nitric acid, in which the reaction temperature is between 20° and 60° C when oxidizing reactant (a) is used and between 20° and 40° C when oxidizing reactant (b) is used.

4,100,342

PROCESS OF PRODUCING DEXTRIN CARBOXYLATES

Joseph H. Finley, Metuchen, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 9, 1976, Ser. No. 712,853

Int. Cl.[2] C08D *37/16;* C07H *13/10*

U.S. Cl. 536—103 4 Claims

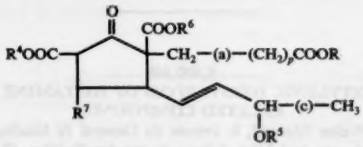
1. In the process of producing a dextrin carboxylate having about 20 to 100 anhydroglucose units of which from about 2.2 to about 3.0 average OH groups per unit are esterified through one of the carboxyls of a non-aromatic polycarboxylic acid of 2–4 carboxyls containing 2 to 10 carbon atoms by reacting the dextrin with at least about 2.8 moles of the anhydride of the polycarboxylic acid, the improvement comprising carrying out the reaction in acetic acid in the presence of a tertiary amine catalyst.

4,100,343
11-DEOXYPROSTAGLANDIN DERIVATIVES

Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Division of Ser. No. 489,856, Jul. 19, 1974, Pat. No. 4,006,136, which is a division of Ser. No. 238,650, Mar. 27, 1972, Pat. No. 3,849,874. This application Nov. 11, 1976, Ser. No. 741,095
The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.
Int. Cl.[2] C07C *177/00*
U.S. Cl. 542—426 4 Claims

1. A compound of the formula



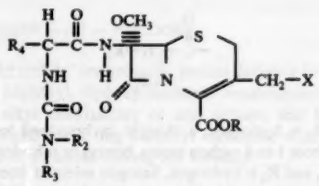
in which (a) is cis CH=CH or C≡C, p is an integer from 2 to 4, (c) is $(CH_2)_q$ wherein q is an integer from 1 to 6, R, R^4 and R^6 each are lower alkyl, R^5 is hydrogen or tetrahydropyran-2-yl, and R^7 is hydrogen.

4,100,344
ALKENYL AND ALKINYLUREIDO CEPHALOSPORINS

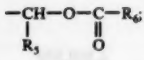
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 664,467, Mar. 8, 1976, Pat. No. 4,028,354. This application Mar. 10, 1977, Ser. No. 776,151
Int. Cl.[2] C07D *501/36*
U.S. Cl. 544—21 26 Claims

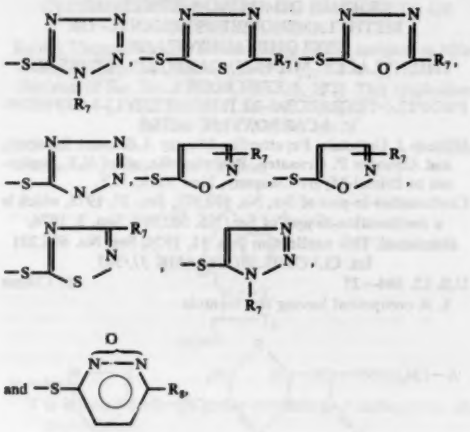
1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl) silyl, trihaloethyl, an alkali metal ion, an alkaline earth metal ion, dibenzylamine, N,N-dibenzylethylenediamine, methylamine, triethylamine, N-ethylpiperidine, or



R_2 is lower alkenyl or lower alkinyl; R_3 is hydrogen or lower alkyl; R_4 is phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and hydroxy, or a mono-substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, and 3-furyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl of 1 to 4 carbons; R_5 is hydrogen or lower alkyl; R_6 is lower alkyl; and X is a heterothio group selected from the group consisting of



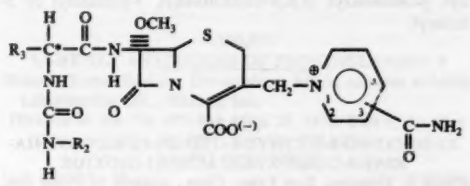
wherein R_7 is hydrogen or lower alkyl of 1 to 4 carbons and R_8 is hydrogen, lower alkyl of 1 to 4 carbons, methoxy, hydroxy, or halogen.

4,100,345
3-(CARBAMOYL)PYRIDINO DERIVATIVES OF 7A-METHOXY UREIDOCEPHALOSPORINS

Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 664,335, Mar. 5, 1976, Pat. No. 4,024,135. This application Jan. 24, 1977, Ser. No. 761,914
Int. Cl.[2] C07D *501/40, 501/44*
U.S. Cl. 544—21 18 Claims

1. A compound of the formula:



wherein the 7α-methoxy substituent is in the α-configuration; R_2 is hydrogen or lower alkyl; R_3 is hydrogen, lower alkyl, cycloalkyl of 3 to 7 carbons, cycloalkenyl of 3 to 7 carbons, cycloalkadienyl of 6 or 7 carbons, phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and hydroxy, or a mono-substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl, and 4-pyridyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl of 1 to 4 carbons; and the

substituent is in 2-, or 3- or 4-position.

4,100,346
CERTAIN 7(O-AMINO-METHYL- OR METHYLAMINOMETHYLPHENYL- OR CYCLOHEXADIENYL- OR THIENYLACETAMIDE)-3[1-CARBOXYMETHYL-(OR ETHYL- OR PROPYL-)-TETRAZOL-5-YLTHIOMETHYL]-3-CEPHEM-4-CARBOXYLIC ACIDS

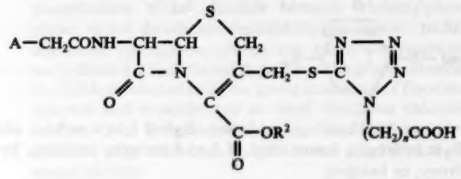
William J. Gottstein, Fayetteville; Murray A. Kaplan, Syracuse, and Alphonse P. Granatek, Baldwinsville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 590,971, Jun. 27, 1975, which is a continuation-in-part of Ser. No. 502,991, Sep. 3, 1974, abandoned. This application Jun. 11, 1976, Ser. No. 695,231

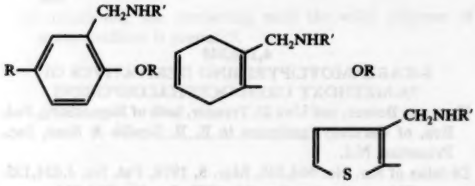
Int. Cl.[2] C07D *501/36;* A61K *31/545*

U.S. Cl. 544—27 17 Claims

1. A compound having the formula



wherein A represents



wherein R is hydrogen, hydroxy or methoxy; R′ is hydrogen or methyl; n is one, two or three; and R^2 is hydrogen, pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3-phthalidyl or 5-indanyl.

4,100,347
3,4-DIHYDRO-2-METHYL-4-OXO-2H-1,2-BENZOTHIAZINE-3-CARBOXYLIC ACID-1,1-DIOXIDE

Philip D. Hammen, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 10, 1976, Ser. No. 694,572

Int. Cl.[2] C07D *279/02*

U.S. Cl. 544—49 1 Claim

1. Crystalline 3,4-dihydro-2-methyl-4-oxo-2H-1,2-benzothiazine-3-carboxylic acid-1,1-dioxide.

4,100,348
TRIOLS CONTAINING HYDANTOIN RINGS

Jürgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

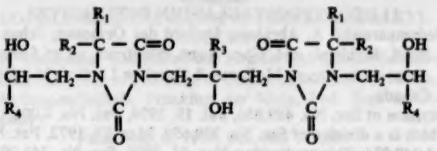
Filed May 21, 1976, Ser. No. 688,647

Claims priority, application Switzerland, May 30, 1975, 6995/75

Int. Cl.[2] C07D *233/42*

U.S. Cl. 548—310 3 Claims

1. A triol of formula I



wherein R_1 and R_2 each denote hydrogen, methyl, ethyl or isobutyl, or together denote tetramethylene or pentamethylene, R_3 denotes hydrogen or methyl, and R_4 denotes hydrogen or methyl or ethyl.

4,100,349
α-ACETYLENIC DERIVATIVES OF HISTAMINE AND RELATED COMPOUNDS

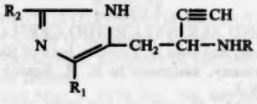
Brian Walter Metcalf, 8, avenue du General de Gaulle, 67000 Strasbourg, and Michel Jung, 1, rue des Dahlias, 67400 Illkirch Graffenstaden, both of France

Filed Jul. 1, 1977, Ser. No. 812,266

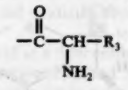
Int. Cl.[2] C07D *233/64*

U.S. Cl. 548—337 9 Claims

1. A compound of the formula



wherein R is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched or



wherein R_3 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; each of R_1 and R_2 is hydrogen, halogen selected from fluorine, chlorine, bromine and iodine, or a straight or branched lower alkyl group of from 1 to 4 carbon atoms and may be the same or different with the proviso that when both of R_1 and R_2 are halogen R_1 and R_2 are the same; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,100,350
3-SUBSTITUTED PROPANOIC ACID DERIVATIVES

William Dawson, Camberley; Michael John Foulis, Bracknell; Norman James Albert Gutteridge, Camberley, and Colin William Smith, Bracknell, all of England, assignors to Lilly Industries Ltd., London, England

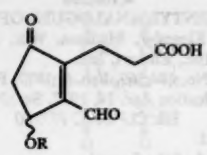
Division of Ser. No. 459,829, Apr. 10, 1974, Pat. No. 4,027,036. This application Mar. 2, 1977, Ser. No. 773,628

Claims priority, application United Kingdom, Apr. 12, 1973, 17736/73

Int. Cl.[2] C07C *79/46;* A01N *9/24;* C07C *69/76*

U.S. Cl. 560—20 4 Claims

1. A compound selected from the group conisting of (1) the carboxylic acid of the formula



wherein R is benzoyl, nitrobenzoyl, halobenzoyl, C_{1-4}-alkylbenzoyl or C_{1-4}-alkoxybenzoyl;

(2) its alkali metal salt;

(3) its C_{1-4} alkyl ester; and

(4) its C_{1-4} haloalkyl ester.

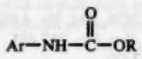
4,100,351

METHOD FOR PREPARING AROMATIC URETHANS

Ugo Romano, Milan, and Renato Tesei, San Donato Milanese (Milan), both of Italy, assignors to Anic, S.p.A., Palermo, Italy

Filed Mar. 24, 1977, Ser. No. 781,065
Claims priority, application Italy, Apr. 14, 1976, 22299 A/76
Int. Cl.² C07C *125/06*
U.S. Cl. 560—24 **6 Claims**

1. The method of preparing an aromatic urethan represented by the general formula:



or

ROCOHN — Ar' — NHCOOR

wherein Ar and Ar' are aromatic groups deriving from phenyl, biphenyl, naphthyl, diphenylmethane, unsubstituted or substituted by alkyl, alkylalkoxy or aryl groups, and R is alkyl, which comprises reacting a dialkyl carbonate with an N-acyl derivative of an amine having the formula:

Ar—NH—Ac

or

Ac—NH—Ar'—NH—Ac

wherein Ar and Ar' have the significance given above and Ac is

or

R' being an alkyl or an aryl radical, in the presence of a Lewis acid selected from the group consisting of the halides, alcoholates and phenates of aluminum or titanium, in the temperature range of from 50° to 200° C and in the pressure range of from 0.1 to 20 abs. atmospheres.

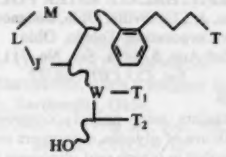
4,100,352

CYCLOHEXANONE-5,6-BENZO ANALOGUES OF PROSTAGLANDIN

Robert Thomas Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 671,423, Mar. 29, 1976. This application Apr. 20, 1977, Ser. No. 789,131
Int. Cl.² C07C *177/00, 69/76*
U.S. Cl. 560—53 **5 Claims**

1. A compound of the formula,



in which:

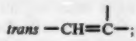
T is selected from the group consisting of carboxyl or alkoxycarbonyl;

M is carbonyl;

L is methylene;

J is ethylene;

W is



T_1 and T_2 are attached to adjacent carbon atoms;

T_1 is hydrogen only if T_2 is loweralkyl; and

T_2 is selected from the group consisting of loweralkyl having 1–5 carbon atoms or a polymethylene radical having 4–6 carbon atoms;

provided, however, that T_2 is the polymethylene radical only when it is joined with W to form a cycloalkylidene radical having 6–8 carbon atoms.

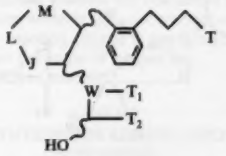
4,100,353

5,6-BENZA ANALOGUES OF PROSTAGLANDIN F

Robert Thomas Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 671,423, Mar. 29, 1976. This application Apr. 20, 1977, Ser. No. 789,130
Int. Cl.² C07C *177/00*
U.S. Cl. 560—55 **6 Claims**

1. A compound of the formula,



in which:

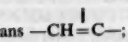
T is selected from the group consisting of carboxyl or alkoxycarbonyl;

M is selected from the group consisting of, R-hydroxymethylene or S-hydroxymethylene;

L is methylene;

J is selected from the group consisting of R-hydroxymethylene or S-hydroxymethylene;

W is trans



T_1 and T_2 are attached to adjacent carbon atoms;
T_1 is hydrogen; and
T_2 is loweralkyl having 1–5 carbon atoms.

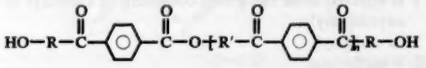
4,100,354

TEREPHTHALATE ESTER POLYOLS

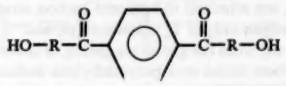
Gwilym E. Owen, Jr., Granville, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Aug. 5, 1976, Ser. No. 711,949
Int. Cl.² C07C *69/82*
U.S. Cl. 560—89 **4 Claims**

1. A terephthalate ester polyol comprising the reaction product of a mixture of glycols, monomers and oligomers and a polyhydric alcohol in which said oligomers have the formula



wherein *m* has a value within the range of from 1 to 3, R represents the group $—CH_2CH_2O]_n$ and n has a value within the range of from 0 to 4 and R^1 represents the group $—CH_2CH_2\text{-}O]_x$ and x has a value within the range of from 1 to 4 and in which said monomers have the formula



wherein R is as defined above.

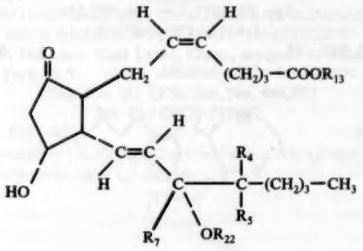
4,100,355

8β,12α-PGE₂-TYPE COMPOUNDS

Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 289,317, Sep. 15, 1972, abandoned. This application Jun. 28, 1973, Ser. No. 374,405
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 **1 Claim**

1. An optically active compound of the formula



wherein R_4, R_5, and R_7 are hydrogen or methyl being the same or different;
wherein R_{13} is hydrogen, alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive;
wherein R_{22} is alkyl of 1 to 5 carbon atoms, inclusive;
including the lower alkanoates thereof and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen.

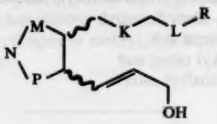
4,100,356

DEPENTYL ANALOGUES OF PGE_1

Harold Clinton Kluender, Madison, Wis., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 684,569, Feb. 9, 1977, Pat. No. 4,065,493. This application Apr. 14, 1977, Ser. No. 787,480
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 **2 Claims**

1. A compound of the formula,



wherein:
L is methylene, ethylene, or trimethylene;
K is ethylene or;
M is carbonyl;
N is methylene;
P is α-hydroxymethylene; and
R is carboxyl; alkoxycarbonyl, the alkyl portion of said alkoxycarbonyl being a lower alkyl radical; or a pharmacologically acceptable non-toxic carboxyl salt.

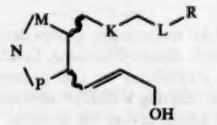
4,100,357

DEPENTYL ANALOGUES OF PGA_1

Harold Clinton Kluender, Madison, Wis., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 684,569, May 10, 1976, Pat. No. 4,065,493. This application Apr. 14, 1977, Ser. No. 787,481
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 **2 Claims**

1. A compound of the formula,



wherein:
L is methylene, ethylene, or trimethylene;
K is ethylene or;
M is carbonyl;
N is methine;
P is methine; and
R is carboxyl; alkoxycarbonyl, the alkyl portion of said alkoxycarbonyl being a lower alkyl radical; or a pharmacologically acceptable non-toxic carboxyl salt.

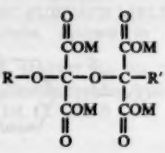
4,100,358

KETAL POLYCARBOXYLATE COMPOUNDS

Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 29, 1976, Ser. No. 736,962
Int. Cl.² C07C *59/22*
U.S. Cl. 560—180 **9 Claims**

1. Compounds of the molecular structure represented by the formula:



wherein M is selected from the group consisting of —H, $—CH_3$, $—C_2H_5$, $—NH_4$, —Na, —K and combinations thereof; R is selected from the group consisting of an alkyl radical (branched or straight chain) containing up to about C_{20}, $—CH(CO_2M)_2$, and $—CH_2CO_2M$, and R′ is selected from the group consisting of an alkyl radical (branched or straight chain) containing up to about C_{20}, —H, and —OR.

4,100,359

CARBONYLATION OF ALCOHOLS

Louis Schmerling, Riverside, and Edwin H. Homeier, Maywood, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 12, 1977, Ser. No. 758,615

Int. Cl.[2] C07C *51/12, 67/36*

U.S. Cl. 560—232 **9 Claims**

1. A process for the carbonylation of a lower alkanol compound which comprises treating said compound with carbon monoxide in the presence of a catalyst consisting essentially of; (1) a cobalt, rhodium, or iridium phthalocyanine compound free of sulfonic acid or sulfonate groups and promoters consisting essentially of both an alkyl halide and a sulfonic acid or sulfonate group donor compound selected from the group consisting of an alkanesulfonic acid, cycloalkanesulfonic acid, arenesulfonic acid, an alkali metal sulfonate, alkaline earth metal sulfonate and ammonium sulfonate, or (2) a cobalt, rhodium, or iridium phthalocyanine compound containing a sulfonic acid or sulfonate group and an alkyl halide promoter, at a temperature in the range of from about 100° to about 250° C. and a pressure within the range of from about 1 to 200 atmospheres, and recovering the resultant carbonylated product.

4,100,360

PROCESS FOR MAKING LOWER ALKYL FORMATES

Donald Lee Smathers, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1977, Ser. No. 772,859

Int. Cl.[2] C07C *67/36*

U.S. Cl. 560—232 **9 Claims**

1. A process for making lower alkyl formate comprising contacting continuously in a closed reactor having a fixed foraminous bed of resin catalyst, an intimate admixture of gaseous CO and liquid C_{1-4} alkanol, said resin catalyst being a strongly basic anion exchange resin in which:

(a) the polymer matrix of the anion exchange resin is poly(-styrenedivinylbenzene) and

(b) the ion-active group of the anion exchange resin corresponds to the structural formula $-CH_2NR_3^+$ in which the R groups are independently selected from the group consisting of C_{1-4} alkyl and hydroxyl-substituted C_{1-2} alkyl groups by which a reaction mixture is formed containing alkyl formate.

4,100,361

MANUFACTURE OF BUTENEDIOL DIACETATES

Hans-Martin Weitz, Bad Durkheim, and Juergen Hartig, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 29, 1976, Ser. No. 727,799

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545698

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—244 **3 Claims**

1. A process for the manufacture of butenediol diacetates, which comprises: reacting butadiene with oxygen and acetic acid in the liquid phase in contact with an effective amount of a supported catalyst at a pressure from about 1 to 1,000 bars and at a temperature of about 60° to 120° C in which the carrier is active charcoal, wherein the catalyst used contains from about 0.1 to 10% by weight, based on the weight of the catalyst, of platinum, from about 0.1 to 5% by weight, based on the weight of the catalyst, of at least one element selected from the group consisting of tellurium and antimony, and additionally contains from about 0.01 to 1.0% by weight, based on the weight of catalyst, of nickel.

4,100,362

OXIDATION PROCESS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

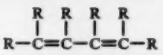
Filed Nov. 19, 1976, Ser. No. 743,195

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—246 **15 Claims**

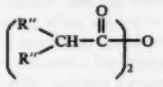
1. A process for the production of unsaturated esters from a conjugated diene which comprises reacting

(a) an acyclic conjugated diolefin having from 4 to 16 carbon atoms per molecule of the formula



wherein each R is individually selected from the group consisting of —H, —F, —Cl, —Br, —I, —CN, —COOR′, alkyl having from 1 to 12 carbon atoms, cycloalkyl having from 5 to 12 carbon atoms and aryl having from 6 to 12 carbon atoms, and combinations thereof, and said R′ is selected from the group consisting of —H, alkyl having from 1 to 10 carbon atoms and aryl having from 6 to 10 carbon atoms;

(b) a carboxylic acid anhydride having from 4 to 20 carbon atoms per molecule of the formula



wherein each R″ is individually selected from the group consisting of hydrogen and alkyl having from 1 to 8 carbon atoms; and

(c) molecular oxygen; in the presence of a catalyst system consisting essentially of cuprous acetate, lithium bromide and 1,2-dibromo-2-butene wherein the amount of copper ion is in the range of from 0.01 to about 1 mole of copper ion per mole of said conjugated diene, the amount of lithium metal ion is in the range of from 0.1 to about 100 moles per mole of copper ion, and the amount of bromide ion is in the range of from 0.1 to about 100 moles per mole of copper ion, and wherein the reaction is carried out in a reaction system wherein the total amount of water present in the initial reaction charge is not greater than about 1 mole of water per mole of copper ion.

4,100,363

2-SUBSTITUTED ISOVALERIC ACID ESTER PESTICIDES

Michael J. Bull, Lower Halstow, and Robert J. G. Searle, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

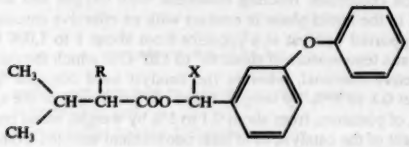
Division of Ser. No. 687,483, May 18, 1976, Pat. No. 4,042,710. This application Apr. 14, 1977, Ser. No. 787,684

Claims priority, application United Kingdom, May 23, 1975, 22662/75; Dec. 22, 1975, 52342/75

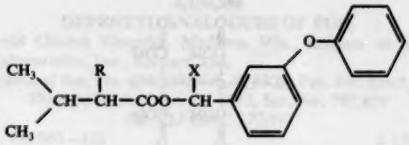
Int. Cl.[2] C07C *69/24;* A01N *9/24*

U.S. Cl. 560—255 **3 Claims**

1. A compound of the formula



wherein R is a straight-chain alkyl group of 1 to 16 carbon atoms and X is a hydrogen atom or an ethynyl group.



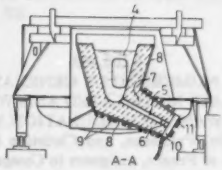
wherein R is a straight-chain alkyl group of 1 to 16 carbon atoms and X is a hydrogen atom or an ethynyl group.

4,100,364

DC ELECTRIC ARC FURNACE MELT CONNECTION

Sten Kollberg, Västerås, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Apr. 26, 1977, Ser. No. 790,939
Claims priority, application Sweden, May 7, 1976, 7605217
Int. Cl.[2] H05B 7/02
U.S. Cl. 13—9 R 4 Claims



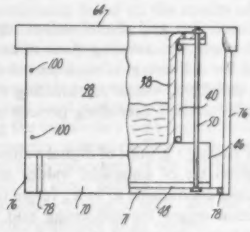
1. An electric arc furnace comprising a hearth having an inside and outside for containing a melt on its inside, an electrode positioned to form an arc between the electrode and a melt in the hearth when the electrode and melt have connections with an electric power source, an electric melt connection comprising at least one elongated metal connector having inner and outer ends and a refractory enclosure exposing the inner end for contact with and melting by a melt in said hearth, and cooling means for cooling the connector at least between its inner and outer ends for removing heat therefrom at a rate preventing the connector from melting throughout its length to its outer end, said refractory enclosure forming a duct containing said connector and the duct and connector extending at a declination straight and free from curvature from the hearth's said inside at least to the part of the connector prevented from melting by said cooling means.

4,100,365

HOUSING FOR AN INDUCTION FURNACE

William J. Duca, Youngstown, Ohio, assignor to American Induction Heating Corporation, Detroit, Mich.

Filed Dec. 20, 1976, Ser. No. 752,152
Int. Cl.[2] H05B 5/00
U.S. Cl. 13—27 10 Claims



1. A housing for an induction furnace comprising:

upper and lower horizontally disposed metal rings, each ring having end portions being closed by at least one electrically insulating fastener to prevent a continuous current path through the ring;

a plurality of vertically extending columns; and

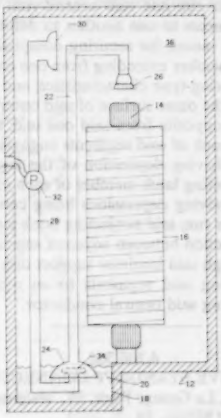
means joining the ends of said vertically extending columns to said upper and lower rings, respectively, to form a unitary framework for housing internal furnace components, with at least one end of each column being electrically insulated from one of said rings.

4,100,366

METHOD AND APPARATUS FOR COOLING ELECTRICAL APPARATUS USING VAPOR LIFT PUMP

Whitney Harris Mears, Amherst, N.Y., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 27, 1976, Ser. No. 754,858
Int. Cl.[2] H01E 27/10
U.S. Cl. 174—15 R 4 Claims



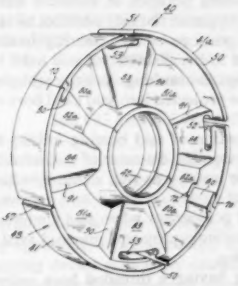
1. In an electrical apparatus having a casing with an electrical conductor disposed therein which is subject to temperature changes when in use, said casing being adapted to contain a non-condensable gas and a vaporizable liquid coolant means for applying liquid coolant to the electrical conductor to effect cooling of the electrical conductor by vaporization of the applied liquid coolant, said casing being adapted to permit the vapors of the liquid coolant and the non-condensable gas to intermix within the casing when the vapors evolve to provide a dielectric medium for insulating the electrical conductor; the improvement wherein the means for applying a liquid coolant to the electrical conductor includes a reservoir for condensed liquid coolant and a vapor lift pump having (1) a liquid inlet in said reservoir, (2) a gaseous inlet adjacent the top of the casing and (3) an outlet over said electrical conductor.

4,100,367

LATCH STRUCTURE FOR INSULATOR SPACER

Philip C. Netzel, Milmont Park, Pa., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 21, 1977, Ser. No. 808,710
Int. Cl.[2] H01B 9/04
U.S. Cl. 174—28 10 Claims



1. An insulator support disk for supporting the central con-

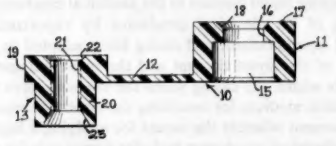
ductor of a gas-insulated transmission line within an outer grounded housing which is coextensive with said central conductor; said insulator support disk consisting of at least first and second identical segments which fit over the central conductor of a transmission line and define a continuous disk therearound; each of said segments having a central axially extending rim for gripping a central conductor and an axially extending outer rim for gripping the interior of an outer housing; each of said segments having a central web extending between said outer rim and said central rim; and means for securing said segments to one another to define a continuous support disk; said means for securing comprising an integral projecting latch member extending from one end of said outer rim and having spring-type characteristics; and a latch-receiving depression in the outer surface of said outer rim at the end of said outer rim opposite from said one end; said projecting latch member of each of said segments engaging and latching into said latch-receiving depression of the segment adjacent thereto; said projecting latch member of each of said segments and said latch-receiving depressions being centered over the width of said outer rim; said projecting latch members extending across the junction between adjacent segments to block a line-of-sight through said insulator support disk from a central conductor receiving said segments to an outer conductive housing surrounding said central conductor.

4,100,368

CAPTIVE STANDOFF CONNECTOR

Jack W. Thomsen, La Grange Park, Ill., assignor to Weckesser Company, Inc., Chicago, Ill.

Filed Jan. 7, 1977, Ser. No. 757,630
Int. Cl.[2] H01B *17/24*; H05K *7/12*; F16B *5/00*
U.S. Cl. 174—138 D **2 Claims**



1. A captive standoff formed from dielectric material for cooperating with a threaded connector to rigidly mount together apertured components in spaced or stacked electrical isolated relationship, comprising

(a) an elongated substantially flat flexible strap,

(b) a circular bushing formed integral with said strap at one end thereof and extending laterally from one flat side surface thereof,

(c) said circular bushing having an outer diameter greater than the aperture formed in the components and provided with an axial bore extending therethrough,

(d) a bearing formed integral with said strap at its opposite end and providing portions of different sizes extending laterally from opposite flat side surfaces of said strap,

(e) one of said portions of said bearing having an outer diameter equal to the diameter of said axial bore formed through said circular bushing whereby said portion of said bearing may be projected into said axial bore of said bushing,

(f) said other portion of said bearing having a peripheral surface larger than the diameter of said axial bore formed in said circular bushing as well as the aperture formed in the component so as to connect said captive standoff to the apertured component when said firstmentioned portion of said bearing is projected into said axial bore of said circular bushing,

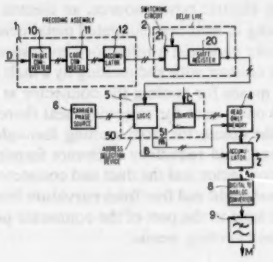
(g) said bearing having a threaded bore extending therethrough and adapted to threadably receive the threaded connector when the same is projected through said axial bore formed in said circular bushing and into the threaded bore of said bearing for connecting said bearing to said bushing and the apertured component therebetween.

4,100,369

DEVICE FOR NUMERICALLY GENERATING A WAVE WHICH IS PHASE MODULATED AND WHICH IS FREE FROM UNWANTED MODULATION PRODUCTS

Claude Stenstrom, Palaiseau, and Christian Saint-Supéry, Le Chesnay, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed Aug. 19, 1976, Ser. No. 715,965
Claims priority, application France, Aug. 29, 1975, 75 26656
Int. Cl.[2] H04L *27/24*
U.S. Cl. 178—67 **7 Claims**



1. Device for generating an output wave which is phase modulated and which is free from unwanted modulation products, said device receiving at a first frequency digital values representing the modulation phase to be applied to a carrier wave, and generating said output wave in the form of a sequence of digital values delivered at a second frequency, said device comprising:

a source for delivering, at said second frequency, digital values representing the phase of the carrier wave to be modulated,

delay means receiving said digital values representing the modulation phase for sampling them at said second frequency and for delivering, at each period of said second frequency, the digital values representing the modulation phase relative to the r preceding periods of said second frequency,

a memory for storing r groups of digital values, corresponding to a given set of sinusoidal values multiplied by r predetermined coefficients k_1 to k_r, respectively,

address selection means for addressing said memory, said selection means being connected to said delay means and to said source for determining, at each period of said second frequency, r data items representative of the r respective sums of the values of the modulation phase for the r preceding periods and the value of the phase of the carrier for said each period, said memory delivering, in response to said r data items, r sinusoidal values corresponding to said r sums, multiplied respectively by k_1 to k_r, and

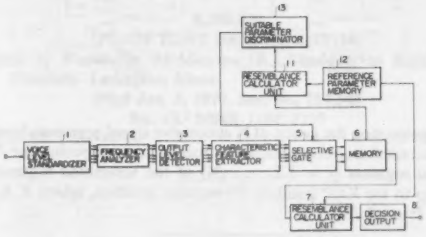
adding means for adding, on each period of said second frequency, the r values delivered by said memory,

said coefficients k_1 to k_r being equal to the weighting coefficients of a low-pass non-recursive filter having a given frequency response.

4,100,370
VOICE VERIFICATION SYSTEM BASED ON WORD PRONUNCIATION

Matsumi Suzuki; Saburo Kitamoto, and Tetsuro Morino, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1976, Ser. No. 750,323
Claims priority, application Japan, Dec. 15, 1975, 50-149320
Int. Cl.[2] G10L 1/00; G06F 15/34
U.S. Cl. 179—1 SB 1 Claim



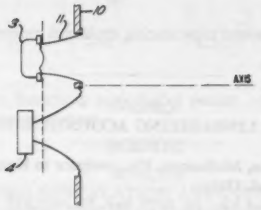
1. A word pronunciation voice verifying system, comprising: a voice level standardizing unit for standardizing the input voice level of a speaker whose voice is to be verified, a frequency analyzer unit for analyzing the standardized voice signal and including a plurality of parallel channels each having a different band pass frequency, an output level detector unit for detecting the output level of each of the plurality of channels, a characteristic feature extracting unit for extracting a plurality of characteristic parameters for one vocal sound from the detected output, a selective gate unit for selecting the parameter to be transmitted, based on a parameter selective signal, out of a plurality of characteristic parameters consisting of binary time series patterns for each of the input voices extracted by the characteristic feature extracting unit, a memory unit for storing the characteristic parameter pattern which has passed through the selective gate unit, a reference parameter memory unit for storing the binary time series pattern of the reference parameter, resemblance calculator units for calculating the resemblance between the parameters of the patterns stored in the memory unit and the reference parameter memory unit, respectively, and for calculating the resemblance between the input pattern which has passed through the selective gate and the time series pattern stored in the reference parameter memory unit, a suitable parameter discriminating unit for selecting a suitable parameter corresponding to a maximum resemblance based on the results of the calculation of the resemblance between the contents stored in the memory unit and the reference parameter memory unit by the resemblance calculator units, and for sending out a selective signal relative to the suitable parameter to the selective gate unit and the memory unit, and a discriminating and output unit for discriminating the vocabulary with regard to the pattern of the reference parameter corresponding to the maximum resemblance derived from the results of the calculation of the resemblance between the input pattern and the reference parameter by the resemblance calculator units, and for sending out the result of the discrimination as an output.

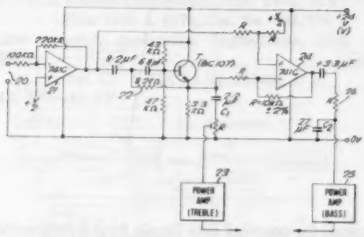
4,100,371
LOUDSPEAKER SYSTEM WITH PHASE DIFFERENCE COMPENSATION

Raymond William Bayliff, Hampton, England, assignor to Decca Limited, London, England

Filed Mar. 17, 1977, Ser. No. 778,472
Claims priority, application United Kingdom, Mar. 24, 1976, 11904/76
Int. Cl.[2] H05K 5/00; H04R 3/14
U.S. Cl. 179—1 E 3 Claims

1. A loudspeaker system comprising: first and second acoustic radiators which respond optimally to electrical signals in a higher frequency range and a lower frequency range respectively, said frequency ranges having a common overlapping region, and said radiators having respective mouths; means for mounting said radiators in a predetermined disposition in which said mouths are co-planar; and means for compensating for phase delay introduced by said second radiator, of lower optimal frequency range, at frequencies in the said overlapping region, this means comprising an acoustic delay disposed between the first radiator, of higher optimal frequency range, and the mouth thereof.





3. A loudspeaker according to claim 1, further comprising: an electrical amplifying circuit which is disposed for the reception of an audio frequency input signal and the production of signals which are uniformly amplified, with respect to the input signal, in a respective one of two adjacent frequency ranges, the circuit including an active high-pass filter, which has substantially unity gain in its pass-band and is coupled to receive the input signal, means for coupling the output of the high-pass filter to said first radiator, an amplifier which is disposed to amplify the difference between the output of the high-pass filter and the said input signal, and means for coupling this difference to said second radiator.

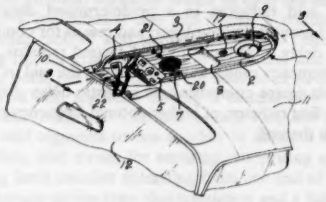
4,100,372
AUDIO CONSOLE SYSTEM FOR HOME AND VEHICLE

Louis Hypolite, 9321 16th Ave., Apt. 2, St.Michel, Canada

Filed Jun. 21, 1977, Ser. No. 808,535
Claims priority, application United Kingdom, Jun. 25, 1977, 26491/77
Int. Cl.[2] H04R 5/00, 1/02
U.S. Cl. 179—1 G 11 Claims

1. An audio console system comprising at least one mounting bracket fixedly securable at the roof of a vehicle cabin and an audio console unit removably securable to said one mounting bracket and including a body forming a recess for a sound reproducing apparatus, a light secured to said body, a first electric plugging device outwardly extending relative to said body and connectable to the electric circuit of the vehicle, a second electric plugging device connected to said first electric plugging device and connectable to said reproducing apparatus, and switch means fixed to said body and operatively con-

necting said light and said second electric plugging device to said first electric plugging device and selectively energizing



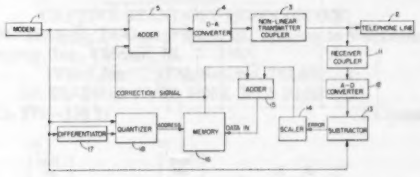
said light and a sound reproducing apparatus mounted into said recess.

4,100,373

ADAPTIVE LINEARIZING ACOUSTIC COUPLING SYSTEM

Frank A. Perkins, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Sep. 28, 1977, Ser. No. 837,572
Int. Cl.[2] H04M *11/00*
U.S. Cl. 179—1 C **10 Claims**



1. A system for coupling data signals from a communication input through a telephone interface coupling device to a telephone line connection output comprising, in combination:

first means, coupled to said communication input, for generating a first signal representative of a data signal to be coupled through the system;

second means, coupled to said telephone line connection output for generating a second signal representative of the data signal as coupled through said telephone interface coupling device and appearing at said telephone line connection output;

third means, coupled to said first and second means, for generating and storing a fourth signal representative of distortion introduced into said data signal by said telephone interface coupling device; and

fourth means, coupled to said first and third means, for combining said first and fourth signals to generate a fifth signal representative of a data signal modified by said forth signal and supplying said fifth signal to said telephone interface coupling device to be coupled therethrough to said telephone line connection output, whereby the signal appearing at said telephone line connection output is substantially free of distortion introduced by said telephone interface coupling device.

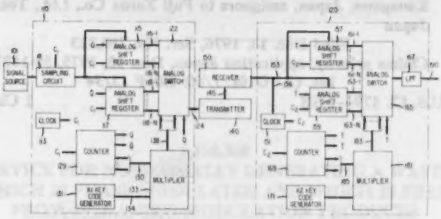
4,100,374

UNIFORM PERMUTATION PRIVACY SYSTEM

Nuggehally Sampath Jayant, Summit, N.J., and Subhash Chandra Kak, New Delhi, India, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 11, 1977, Ser. No. 786,129
Int. Cl.[2] H04K *1/06*
U.S. Cl. 179—1.5 S **16 Claims**

1. A privacy communication system comprising means for partitioning an intelligence signal into groups of N successive signal segments; means responsive to each group of signal segments for uniformly permuting the temporal sequence of the N successive segments to form a scrambled signal segment group comprising means for transposing the i^{th} signal segment ($i = 1,2, \ldots N$) to the $K_1 i^{th}$ (modulo N) segment position, where K_1 is an integer prime with respect to N; and means for



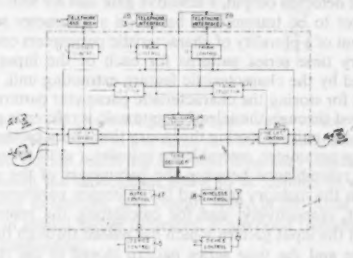
reconstructing the group of N successive signal segments from the scrambled group comprising means for transposing the j^{th} signal segment ($j = 1,2, \ldots ,N$) of the scrambled segment group to the $K_2 j^{th}$ (modulo N) segment position, where $K_2 K_1 = 1$ (modulo N).

4,100,375

TELEPHONE, INTERCOM AND REMOTE CONTROL SYSTEM

David Lewis Noller, 10402 1/2 Wheatland Ave., Los Angeles, Calif. 91040

Filed Jan. 19, 1977, Ser. No. 760,813
Int. Cl.[2] H04M *3/58, 9/02, 11/02*
U.S. Cl. 179—2 A **6 Claims**



1. In combination with a key service unit including a digital tone decoder; power supply; a 400 KSU; a utility telephone company interface; and a plurality of single line telephone instruments with digital tone dialing, a combined remote control, intercom and telephone system comprising:

a telephone hookswitch sensing circuit operatively connected to said telephone instruments for triggering a tone decoder control circuit, conditioning the talk path gate circuit to energize with incoming calls when said telephone instrument is not in use, and canceling said conditioning at the termination of the call;

a tone decoder control circuit operatively connected to said hookswitch sensing circuit responding to a telephone off hook and coupling the input of said tone decoder to the talk path of said telephone instruments;

a time delay circuit operatively connected to the tone decoder control circuit to maintain operation of same for a predetermined time interval;

a talk path gate circuit which shifts the operation of said telephones from intercom talk battery to said telephone interfaces in response to said tone decoder output or said 400 KSU circuits signaling of an incoming call, and cancels the operation of said tone decoder control circuit during tone signaling thru the telephone company network;

a HOLD feature control circuit operatively connected to

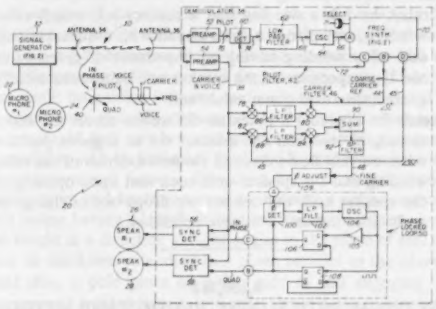
the output of said tone decoder and triggering the operation of said 400 KSU circuits initiating the condition of outside call holding;

A bi-stable remote control circuit operatively connected to said tone decoder causing a maintained switch closure for operation of remote devices in one mode and a maintained open switch condition in the alternate mode, producing an audio hum on the talk path for approximately one second during the transition from closed to open switch conditions.

4,100,376
PILOT TONE DEMODULATOR

Saul L. Woythaler, Middletown, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1977, Ser. No. 757,548
Int. Cl.² H04B *1/68, 3/10*
U.S. Cl. 179—15 BP **3 Claims**



1. A demodulator of a signal bearing data operative with a pilot tone lying outside the spectrum of said data signal, said demodulator comprising:

phase lock means for providing a first signal which is phase locked to said pilot tone, said phase lock means including frequency synthesizing means for generating a carrier reference signal having a frequency proportional to the frequency of said pilot tone;

means coupled to said reference signal for filtering said data signal to extract a carrier therefrom, the frequency of said reference signal approximating the frequency of said carrier, said filtering means including means for mixing said data signal with said reference signal to produce a first lower frequency signal, means for filtering said first lower frequency signal and means for mixing said first lower frequency signal with said reference signal to provide a first component of said carrier; and

means coupled to said filtering means for providing signals bearing inphase and quadrature relationships to said reference signal, and means coupled to said inphase and quadrature signals for synchronously detecting said data signal.

4,100,377
PACKET TRANSMISSION OF SPEECH

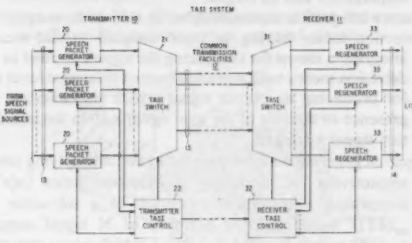
James Loton Flanagan, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 28, 1977, Ser. No. 791,782
Int. Cl.² H04J *6/02*
U.S. Cl. 179—15 AS **14 Claims**

1. A multiplex transmission system for transmitting digital signals from a plurality of signal sources, at least one of which is a speech signal source, on common transmission facilities, said system comprising:

a speech packet generator for assembling at least one speech talkspurt into a single digital packet;

means for appending a header block at the beginning of each said digital packet, said header block including a time code indicating the time at which the appended talkspurt was initiated; and

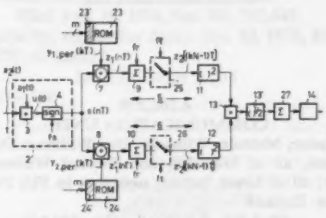


means for launching said digital packet on said multiplex transmission system.

4,100,378
CROSS-CORRELATION ARRANGEMENT

Theodoor Antonius Carel Maria Claasen, and Johannes Bernhard Heinrich Peek, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 1, 1976, Ser. No. 728,796
Claims priority, application Netherlands, Oct. 6, 1975, 7511707
Int. Cl.² G01R *23/02;* **H04M** *1/50*
U.S. Cl. 179—84 VF **4 Claims**



1. A cross-correlation arrangement for determining the presence or absence of at least one tone signal $x_2(t)$, having a known frequency and having a given minimum time duration τ_m in an information signal $x_1(t)$ whose form and frequency are unknown, said arrangement comprising

an input channel means for receiving the information signal $x_1(t)$, said input channel comprising:

means comprising adder means and sampling and coding means coupled to said adder means for producing a first series $\{s(nT)\}$ of sum signal samples, said sum signal samples $s(nT)$ being produced with a sampling period T, the relationship between each of the sum signal samples $s(nT)$ and information signal samples $x_1(nT)$ being given by $s(nT) = \text{sign}\,[x_1(nT) + a_1(nT)]$, in which expression $a_1(nT)$ represents a sample of a predetermined auxiliary signal;

a pulse generator means coupled to said sampling means for producing sampling pulses with a period T for controlling the sampling means;

at least two correlating channels each comprising:

multiplying means coupled to said sampling means for producing a series $z_1(nT)$ of signal samples $z_1(nT)$ occurring with a period T, the relation between the signal sample $z_1(nT)$ and the signal samples $s(nT)$ and $y(nT)$ being given by the expression $z_1(nT) = s(nT) \cdot y(nT)$,

first integration means coupled to said multiplying means to which said signal samples $z_1(nT)$ are applied; and

means coupled to said first integration means for converting the integration means output signals into a unipolar signal;

adder means having inputs coupled to said converter means respectively and an output;

second integration means coupled to said adder output;

detection means having an input coupled to said second integration means for comparing the signals applied to the detection means with a predetermined reference level and for producing an output signal which characterizes the presence or absence of the tone signal $x_2(t)$ in the information signal $x_1(t)$; and

a pair of generation means coupled to said multiplying means respectively for producing a periodical series $\{y(nT)\}$ comprising a periodical repetition of a sub-series $\{y_{per}(kT)\}$ including of a plurality of N signal samples $y_{per}(kT)$ where $k = 0,1, \ldots N-1$ which occur one after the other with the sampling period T, the relation between the signal samples $y_{per}(kT)$ and the tone signal $x_2(T)$ being given by the expression $y_{per}(kT) = \text{sign}\{x_2[(p+k)T] + a_2[(p+k)T]\}$ where p represents a fixed number; $x_2(p+k)T$ the instantaneous value of the tone signal $x_2(t)$ at an instant $(p+k)T$ and $a_2(p+k)T$, the instantaneous value of a second auxiliary signal $a_2(t)$ at the instant $(p+k)T$ and in which the time duration NT of the sub-series $\{y_{per}(kT)\}$ is smaller than or equal to the minimum time τ_o during which the known tone signal $x_2(t)$ is at least present in the information signal $x_{1(t)}$.

4,100,379

COMMUNICATION UNITS

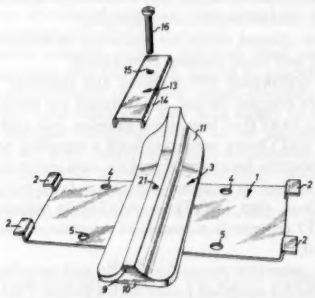
David Carter; Malcolm Withnall; Alan Williams; Digby Ralph Redshaw, all of Warwick, and Richard William Stevens, Surrey, all of Great Britain, assignors to The Post Office, London, England

Filed Feb. 7, 1977, Ser. No. 766,366

Claims priority, application United Kingdom, Feb. 11, 1976, 5438/76

Int. Cl.² H04M 1/11

U.S. Cl. 179—147 R **4 Claims**



1. A jointing assembly for juxtaposed communication units, such assembly comprising a base element adapted to extend beneath said units, locating parts on the base element for engagement with complimentary parts on the undersurface of the units thereby locating the units in a predetermined side-by-side relationship and means for fixing the assembly to the units and a spacer element attached to the base element against which adjacent side surfaces of juxtaposed units abut.

4,100,380

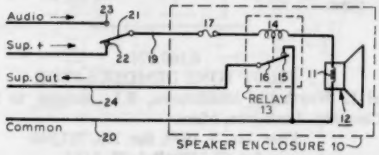
SUPERVISORY CIRCUIT FOR MONITORING SPEAKER COILS

Earl W. Gosswiller, Clarendon Hills, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.

Filed Mar. 12, 1976, Ser. No. 666,409

Int. Cl.² H04R 29/00

U.S. Cl. 179—175.1 A **6 Claims**



1. A supervisory circuit for monitoring the condition of a speaker coil, comprising:

a relay, having a winding and a contact set, which relay winding is coupled in a series circuit with the speaker coil, said relay winding having an impedance of given value and the impedance of the speaker coil being substantially greater than said given value; and

means for applying a potential difference across the series circuit, to maintain the contact set in a given position when current flows through the series circuit of the relay winding and the speaker coil, such that upon opening of the speaker coil, the contact set drops out of the given position to indicate a trouble condition.

4,100,381

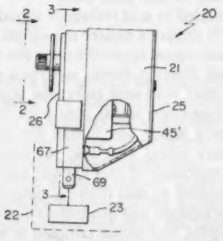
ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Edgar E. Marquis, Newtown, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 18, 1976, Ser. No. 742,756

Int. Cl.² H01H 43/10

U.S. Cl. 200—38 A **10 Claims**

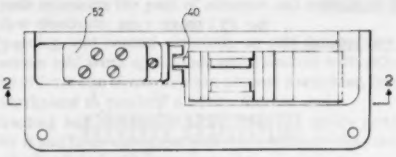


1. In an electrical switch construction having an electrical switch provided with different operating conditions and having means operatively associated with said switch for causing said switch to be repetitively in one condition thereof a certain percentage of a certain increment of time and for being in another condition thereof for the remainder of said certain increment of time, said means being adapted for selecting the amount of said certain percentage of said certain increment of time within certain limits, said means including a rotatable cam member having a cam part for camming said switch to one of said operating conditions thereof during each revolution of said cam member, the improvement wherein said cam part of said cam member is radially movable relative thereto, said means being adaptable for selecting a radial position of said cam part for camming said switch or a radial position of said cam part that will not cam said switch.

4,100,382
PERMANENT MAGNET LATCH FOR SPEED SWITCHING DEVICE

Herbert Hollitscher, Peterborough, Canada, assignor to Canadian General Electric Co., Ltd., Toronto, Canada

Filed Mar. 4, 1977, Ser. No. 774,356
Claims priority, application Canada, Jul. 30, 1976, 958247
Int. Cl.[2] H01H 35/00
U.S. Cl. 200—61.46 7 Claims



1. In a speed switch for a motor, an electrically conductive disc supported for rotation with the rotor of a motor, a drag member supported adjacent said disc for limited movement and having a permanent magnet linked magnetically with said disc for causing a force on said drag member through electromagnetic interaction between said permanent magnet and the rotating disc, switching means actuated by said limited movement of said drag member, and an improved latching means for restraining said drag member from said limited movement until a predetermined force is developed by said electromagnetic interaction, said latching means comprising a permanent magnet means having a length, height and thickness mounted with its height in a direction at right angles to the plane of said disc and its thickness extending in a plane parallel to the plane of said disc, a pole piece on either side of and engaging said permanent magnet means, said pole pieces defining the thickness of said permanent magnet means, said pole pieces projecting towards said drag member and each terminating in a wedge-shaped, flux concentrating configuration, the drag member having at least three teeth, two of said teeth being separated by at least one intermediate tooth and each one of said two teeth being located opposite to and closely spaced from a respective one of said terminating wedge-shaped ends of said pole pieces, said pole pieces also extending in a direction opposite said terminating wedge-shaped ends and having arm portions extending towards one another and terminating short of one another to define a gap therebetween, and a magnetic shunt means mounted for movement into a position in said gap between said arm portions and into a position withdrawn from said gap for adjustment of the amount of shunted magnetic flux and thereby the latching force.

4,100,383
INDUSTRIAL REVERSING SPEED CONTROL TRIGGER SWITCHES HAVING SNAP-IN MODULES

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 2, 1976, Ser. No. 711,108
Int. Cl.[2] H01H 9/06; H02P 7/00
U.S. Cl. 200—157 14 Claims

1. An industrial reversing speed control trigger switch of modular construction comprising:

a frame having a trigger aperture therein;

an insulating base including on-off switch contacts and a speed control circuit and means mounting said speed control circuit in said base;

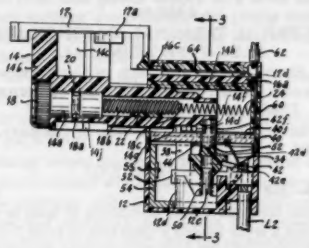
first snap-in means coupling said base to said frame;

a spring-return trigger slidably mounted within said frame on top of said base and extending out through said aperture and comprising means for actuating said on-off switch contacts and means for operating said speed control circuit when said trigger is depressed;

a reversing switch comprising an enclosure and reversing switch movable and stationary contacts housed therein and an operating lever;

second snap-in means coupling said reversing switch enclosure to said frame;

means in said base for making connections between said on-off switch contacts and an external circuit;



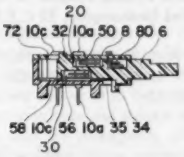
means in said enclosure for making connections between said reversing switch contacts and the external circuit;

and internal connector means connecting a reversing switch stationary contact to said speed control circuit.

4,100,384
PUSHBUTTON SWITCH UNIT WITH REVERSIBLE SPRING

Matsuo Nishioka, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 18, 1976, Ser. No. 715,645
Claims priority, application Japan, Sep. 10, 1975, 50-110226; Sep. 10, 1975, 50-110227
Int. Cl.[2] H01H 13/56
U.S. Cl. 200—160 7 Claims



1. A push lock switch unit comprising;

a. an elongated housing having an opening at one end thereof and including at least one pair of spaced terminals each having one end situated within said housing and the other end projecting outwards from said housing for external electric connection;

b. an elongated movable body coaxially housed in said elongated housing for axial movement between depressed and projected positions, said movable body having one end extending outwards from said housing through said opening and the other end housed within said housing;

c. spring means connected between said elongated housing and said elongated movable body, said spring means consisting of a spring structure for exerting an expanding force in a diagonal direction with respect to the direction of movement of said elongated movable body for urging said elongated movable body only towards said projected position, said expanding force gradually decreasing as said elongated movable body is moved from said projected position towards said depressed position; and

d. at least one contact member carried by said elongated movable body for electrically connecting said ends of said terminals within said housing to each other when said elongated movable body is moved to said depressed posi-

tion by the application of an external pushing force to said body.

4,100,385

ELECTRICAL TERMINAL, PARTICULARLY PLUG-TYPE TERMINAL

Max Wutz, Hanau (Main), Fed. Rep. of Germany, assignor to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Jul. 16, 1976, Ser. No. 705,917

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2536985

Int. Cl.² H01H *1/02*

U.S. Cl. 200—268 **13 Claims**

8. Electrical terminal which comprises at least in a contact portion thereof a layer having a thickness of from 2 to 100 μ m of a contact material which is at least one material selected from the group consisting of aluminum, titanium, niobium, chromium, silicon, zirconium, and tantalum and a contact surface comprising;

a porous cover layer of from between 0.01 to 1 μ m thick of a noble metal or noble metal alloy on the surface of said contact material to form an electrical conductive connection therewith; and

an oxide of the contact material integral with said contact material located in the pores of said porous noble metal or noble metal alloy.

4,100,386

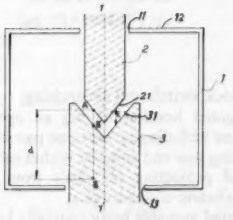
PROCESS FOR SINTERING CERAMIC PRODUCTS

Gerard Bardet, Paris, France, assignor to Automatisme & Technique, Arcueil and Desmarquest Et C.E.C., Montrouge, both of, France

Filed Aug. 23, 1976, Ser. No. 716,552

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 M **5 Claims**



1. A process for sintering or melting ceramic or refractory products in a sounding cavity, comprising placing in a sounding cavity on opposing member in a sounding cavity on opposing member close to but spaced from a ceramic or refractory product in said cavity an opposing member, and subjecting said product and member to the action of a hyperfrequential electromagnetic field to heat them to a predetermined temperature, said opposing member formed from a material having dielectric losses higher than those of said product in the temperature range below said predetermined temperature, whereby the intensity of the hyperfrequential electromagnetic field will be increased locally in the immediate vicinity of the surface area of said product opposed to said member, and said area will be exposed to thermic radiation from said member and be protected by that member from thermic losses.

4,100,387

APPARATUS FOR THE INDUCTIVE HEATING OF WORKPIECES ESPECIALLY FOR THE HEATING OF CAM SHAFTS

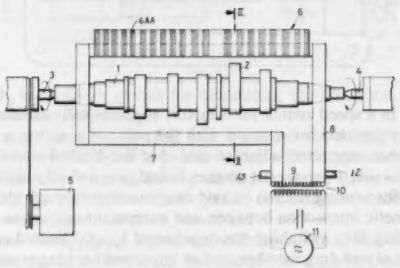
Friedhelm Reinke, Remscheid; Ludwig Mackenberger, Neschen, and Eckhard Siefert, Langenberg, all of Germany, assignors to AEG-Elotherm, G.m.b.H., Remscheid-Hasten, Germany.

Filed Aug. 10, 1976, Ser. No. 713,182

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1975, 2538690

Int. Cl.² H05B *5/08*

U.S. Cl. 219—10.57 **3 Claims**



1. An apparatus for inductive heating to surface harden an eccentric workpiece made of hardenable material with extensions disposed eccentrically in relation to its longitudinal axis, said heating apparatus comprising:

means for clamping said eccentric workpiece for rotation;

driving means acting upon said clamping arrangement for rotating said eccentric workpiece around its longitudinal axis; and

inductor means for inductive heating said eccentric workpiece, disposed at an air distance from the surface of said eccentric workpiece, and including a linear conductor disposed at a distance from the rotational axis of said eccentric workpiece running outside in the direction of the longitudinal axis of the eccentric workpiece, at least as far from said axis as the envelope cylinder surface of the eccentric workpiece, which is assigned to the eccentric extension of the greatest length.

4,100,388

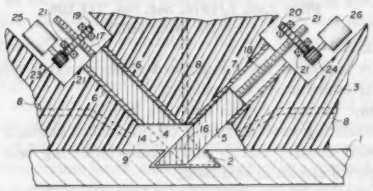
ELECTROEROSION METHOD AND APPARATUS FOR MACHINING UNDERCUT CHANNELS IN A WORKPIECE

Gilbert Meyer, 184 Berkely Ct., Cornwells Heights, Pa. 19020

Filed Jan. 7, 1977, Ser. No. 757,635

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 M **21 Claims**



1. A method of cutting channels of undercut profile in a workpiece by electroerosion machining, comprising the steps of:

securing the workpiece to a fixture body equipped with a plurality of electroerosion tool electrodes movably set

therein adjacent to a work space between said fixture body and said workpiece;

advancing a first of said electrodes across said work space and, under control with reference to at least one electroerosion process parameter, obliquely into said workpiece for a predetermined distance to produce a cavity therein;

retracting said first electrode from said cavity and from enough of said work space to clear a path for a second electrode of said electrodes across said work space, which path intersects the path of advance and retraction of said first electrode;

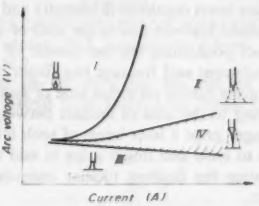
advancing said second electrode on said intersecting path across said work space and, under control with reference to at least one electroerosion process parameter, into said workpiece to produce a cavity therein, and

retracting said second electrode from the cavity produced by it and from enough of said work space to clear the path of advance of said first electrode.

4,100,389
METHOD OF HIGH SPEED GAS SHIELDED ARC WELDING

Jinkichi Tanaka; Itaru Watanabe, and Motoaki Suzuki, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 751,984
Claims priority, application Japan, Dec. 24, 1975, 50-153463
Int. Cl.² B23K *9/02*
U.S. Cl. 219—74 **11 Claims**



1. In a gas shielded arc welding method for a long seam of formed pipe and the like, the improvement comprising:

feeding a formed pipe, or the like, past a welding station at a high welding speed of at least 3m/min; and

applying, via an electrode having a diameter of at least 3.0mm, a welding voltage and a welding current of at least 400 amperes to said passing formed pipe in the vicinity of the seam to be formed thereon at a combined welding voltage and current level to produce a welding arc and incomplete short circuit transfer so that a pinch force is caused at a tip of the electrode and the molten tip of the electrode is lengthened by the pinch force and is put into contact with the molten metal of the seam, and so that another arc is produced from the side of the electrode, and the molten electrode tip is enclosed in the arc and the pinch force of the arc acts on the molten portion, said combined welding voltage and current level being such that the arc produced by the welding voltage and current does not stop at a time of a short circuit.

4,100,390
CONTROL MEANS FOR TIG TYPE TORCHES AND THE LIKE

George Robert Jackson, Oakford, Pa., assignor to Arcstart, Inc., Oakford, Pa.

Filed Nov. 17, 1975, Ser. No. 632,862
Int. Cl.² B23K *9/10*
U.S. Cl. 219—74 **19 Claims**

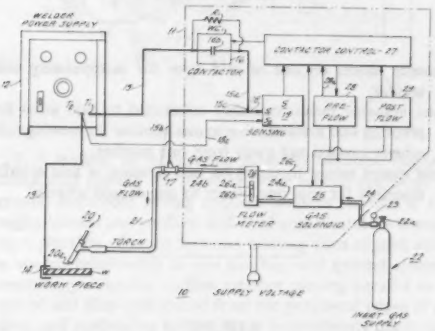
1. In an arc welder including a torch, and a power supply coupled between said torch and a workpiece, control means for selectively supplying power sufficient to initiate and maintain an arc for performing an arc welding operation, said torch including a welding electrode and means for receiving a gas and directing the gas to the welding electrode region, said control means comprising:

current reducing means remotely located from said torch and electrically connected between said torch and said power supply for reducing the current delivered to said torch from said power supply to a level insufficient to initiate welding even though the power supply is energized, while delivering a reduced level of current to the torch and workpiece;

means for selectively short-circuiting said current reducing means;

valve means for selectively coupling the gas receiving means to a gas source;

first sensing means responsive to establishment of an electrical circuit caused when said torch electrode even momentarily contacts said workpiece for opening said valve means and including means for preventing said valve means from closing until after the power delivered to said torch reaches a level sufficient to initiate welding;



first delay means responsive to operation of said first sensing means for activating said short circuiting means a predetermined delay interval after opening of said valve means whereby the power delivered to the workpiece is raised to a level sufficient to initiate and sustain an arc between the torch electrode and the workpiece, while enabling said gas to purge the welding region preparatory to the initiation of an arc; and

second sensing means including second delay means for sensing the engagement of the torch electrode with the workpiece for the interval of said second delay means to deactivate said valve means and activate said short-circuiting means whereby the power is lowered to a level insufficient to maintain an arc and gas purges the welding region for a period sufficient to permit the welding region to cool; said delay period for said second delay means being of a length sufficient to prevent the torch electrode from becoming welded to the workpiece.

4,100,391
PORTABLE SEAM WELDER

William T. Wilbur, New Baltimore, Mich., assignor to Progressive Machinery Corporation, Pontiac, Mich.

Filed Sep. 13, 1976, Ser. No. 722,349
Int. Cl.² B23K *11/06*
U.S. Cl. 219—81 **17 Claims**

1. A portable seam welder comprising

a pair of arms pivoted to one another about a pivot axis,

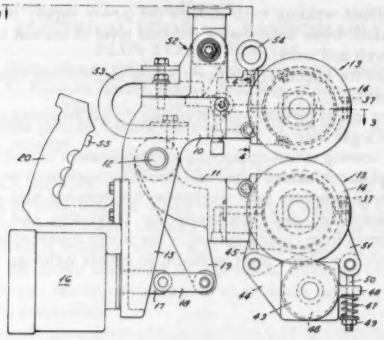
a spindle assembly mounted on each arm,

each spindle assembly including a housing, a shaft, and spaced radial and axial bearings electrically isolated from one of said housing and said shaft for rotatably mounting said shaft in said housing about an axis extending generally

parallel to said pivot axis and perpendicular to the longitudinal axis of its respective arm,

a weld wheel on each shaft,

electrical collector ring contact means independent of said bearings for transmitting power between said housing and said shaft and in turn to said wheel,



handle means on one of said arms for manipulating said welder,

and actuator means operably connected to said arms for pivoting said arms relative to one another for moving said wheels toward and away from one another,

and motor means mounted on said housing of said spindle assembly for applying power to one of said wheels.

4,100,392

ASSEMBLY OF A MAGNET AND A POLE PIECE

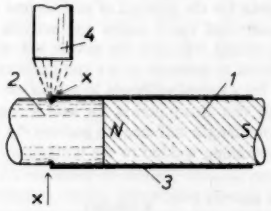
Sylvain Maurice Dron, Meudon-la-Foret, and Gerard Maurice Gaspard Evrard, Livry-Gargan, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA), Paris, France

Filed Jul. 7, 1976, Ser. No. 703,304

Claims priority, application France, Jul. 10, 1975, 75 22454

Int. Cl.² B23K *15/00*

U.S. Cl. 219—121 EM **3 Claims**



1. A method for joining a magnet to a pole piece with the respective flat faces thereof confronting each other, comprising the steps of truing-up said flat faces, abutting the magnet and the pole piece by their trued flat faces, connecting the magnet to the pole piece by a mechanical constricting tube member made of a non-magnetic material to exert a constrictional circumferential stress both on the magnet and the pole piece, and applying energy from a distance to the constricting member to obtain a weld at a location outside the magnet and only between the constricting member and the pole piece, whereby the retention forces at the common plane of said faces remain after terminaton of said application of energy.

4,100,393

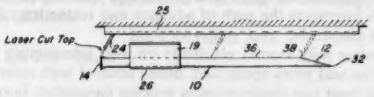
METHOD FOR MAKING A CANNULA USING A LASER AND THE CANNULA MADE THEREBY

Ronald B. Luther, 1737 Bayport Way, Newport Beach, Calif. 92660

Filed Feb. 8, 1977, Ser. No. 766,735

Int. Cl.² B23K *9/00*

U.S. Cl. 219—121 LM **4 Claims**



1. A method for making a removable catheterization cannula from tubular cannula stock having a bevel forming a tip end and a distal area comprising the steps of:

(a) supporting a piece of tubular cannula stock for work operations;

(b) applying to the outside of the wall of said stock from one end of said stock to the other on a straight longitudinal line whose anterior end is at the bevel distal area a laser beam regulated in intensity and duration to cut completely through the wall of said stock to form a straight longitudinal slot in said stock ending at the bevel distal area;

(c) applying to the inside of the wall of said stock opposite said slot from one end of said stock to the other on a straight longitudinal line whose anterior end is at the bevel tip a laser beam regulated in intensity and duration to form a weakened fracture line in the wall of said stock;

(d) contact positioning on the outside of the wall of said stock adjacent said fracture line finger grips so that said finger grips extend on either side of said fracture line;

(e) applying to the area of contact between said stock and said finger grips a laser beam of such intensity and duration as to weld said finger grips to said stock; and

(f) removing the finished tubular cannula stock from the support.

4,100,394

ELECTRIC WATER HEATER AND HOT WATER DISPENSER

George E. Tilp, Short Hills, N.J., assignor to Adams Industries, Inc., Union, N.J.

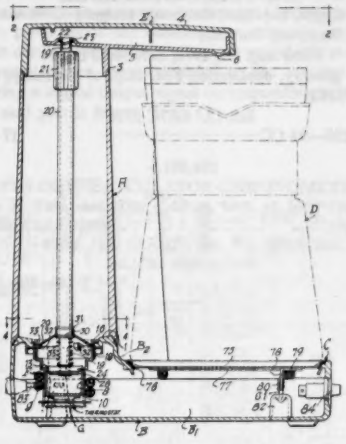
Filed Dec. 12, 1975, Ser. No. 640,182

Int. Cl.² H05B *1/00*; A47J *31/057*; F24H *1/10*; F04B *19/24*

U.S. Cl. 219—296 **14 Claims**

1. An electric water heater and dispenser comprising a water container having an open top and a bottom wall formed with a hole, a pump well mounted in said hole and depending from said bottom wall and having an upwardly facing pump seat, a pump including a pump tube having mounted thereon a perforated pump plate to separably set on said pump seat and a pump valve coactive with said pump plate, so that when said pump plate is set on said seat, water can be heated in said well below said pump plate and discharged through said pump tube, and means manually manipulatable through said open top for positively and removably locking said pump on said pump seat, said means including a retainer plate slidably mounted on said pump tube, coactive locking means on said retainer plate and said pump well engageable by rotation of said retainer plate relative to said well to releasably hold the retainer plate in

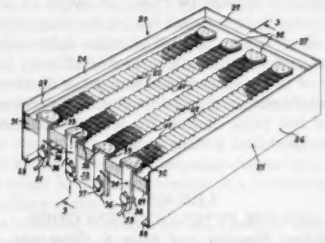
fixed position relative to said pump well, spring means disposed between said pump plate and said retainer plate to bias said pump plate away from said retainer plate so that said pump plate will be urged into engagement with said pump seat.



4,100,395
EXPANDED ELEMENT RADIANT HEATING DEVICE

Jules Ballard, Teaneck, N.J., assignor to Glenro, Inc., Upper Saddle River, N.J.

Filed Jun. 29, 1976, Ser. No. 700,944
Int. Cl.[2] H05B *3/26;* H01C *1/14;* H05B *3/08*
U.S. Cl. 219—356 **9 Claims**

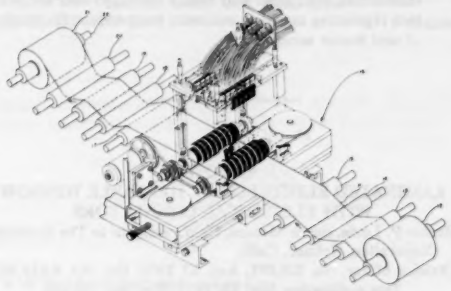


1. A high temperature rapid response heating device capable of operating between 1000° F and 2000° F, comprising at least one expanded, corrugated heating element having flat portions at each of its longitudinal ends, terminal means for each end of said heating element, said terminal means including a metallic terminal bracket of right angle configuration having a short leg of approximate delta shape and a long leg and a flat metallic platelet of approximate delta shape, said short leg being on one side of said flat portion and said platelet being on the other side of said flat portion when said short leg and said platelet are secured together with said heating element flat portion therebetween, means for rigidly securing said terminal means to said flat portions, a refractory backing for carrying said heating element, stapling means for securing strands of said heating element to said refractory backing at spaced intervals along the longitudinal length of said heating element, said long leg of each terminal bracket extending through said refractory backing, adjustable means associated with said long leg of each bracket for securing said terminal means and heating element ends to said refractory backing, a casing for carrying said heating element and refractory backing, and means within said casing for supporting said heating element and refractory backing.

4,100,396
METHOD FOR ELECTRICALLY PERFORATING MOVING WEBS

Richard Hugo Martin, Pisgah Forest, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Division of Ser. No. 654,201, Feb. 2, 1976, Pat. No. 4,029,938.
This application Feb. 14, 1977, Ser. No. 768,224
Int. Cl.[2] H05B *7/18*
U.S. Cl. 219—384 **10 Claims**

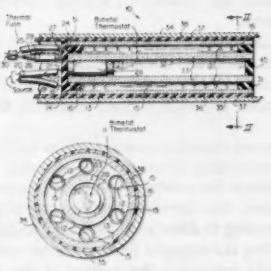


1. A method for perforating paper by electrical discharge comprising passing the paper between spaced discharge and ground electrodes having opposed surfaces moving at right angles toward one another, said discharge electrodes comprising a plurality of equal diameter rotating discs aligned axially in spaced relationship to one another, said ground electrode comprising a narrow endless member moving parallel to the axis of said discs and spaced from the peripheral edges of said discs, and perforating said paper by intermittently discharging an electric current between the edges of each of said discs and said member through the paper.

4,100,397
THERMOSTATICALLY CONTROLLED ELECTRICAL HEATER ASSEMBLY

Yuri Kunimi, Belmont, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jul. 8, 1976, Ser. No. 703,571
Int. Cl.[2] H05B *1/02, 3/02;* H01H *37/52*
U.S. Cl. 219—512 **9 Claims**



1. A heater assembly comprising:
electrically energized heater means for generating heat;
temperature regulating means substantially encircled by terminal means electrically coupling said temperature regulating means in circuit with said heater means for controlling operation of said heater means over a pre-

ferred operating temperature range of said heater means; and

a heat conducting core of electrically insulating material for supporting said heater means and said temperature regulating means, said core having a cavity and said temperature regulating means being coaxially disposed substantially entirely within said cavity with said terminal means having substantially all of its outer peripheral surface in friction contact with the surface of said cavity, and separated from said heater means by the material of said core, whereby said core and said terminal means provide a thermal path having a selected thermal resistance for conducting heat from said heater means to said temperature regulating means to minimize temperature fluctuation of said heater means.

4,100,398

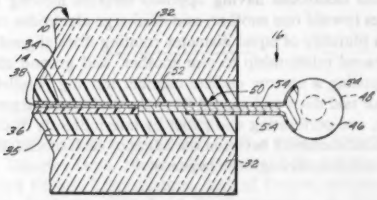
LAMINATED ELECTRICALLY HEATABLE WINDOW WITH ELECTRICAL CONNECTORS

Berton P. Levin, Santa Monica, Calif., assignor to The Sierracin Corporation, Sylmar, Calif.

Division of Ser. No. 608,091, Aug. 27, 1975, Pat. No. 4,029,942. This application Apr. 22, 1977, Ser. No. 790,042

Int. Cl.² H05B 3/06

U.S. Cl. 219—541 **21 Claims**



1. A laminated electrically heatable window comprising:

a pair of transparent face plies,

a transparent laminate between the face plies, the transparent laminate including an electrically resistive heating element,

an electrically conductive lead in contact with the resistive element, a portion of the electrically conductive lead extending outside an edge of the face plies,

an electrical cable for conducting electric current to the resistive element,

first electrical connector means comprising a first electrical contact means on the end of the portion of the electrically conductive lead extending outside said edge of the face plies, and second electrical contact means on the end of the cable,

the first and second electrical contact means being engageable as a cooperating electrically conductive pin-and-socket connection for conducting electric current to the resistive element, the electrical contact means including means cooperating to form an electrically insulated exterior surrounding the engaged pin-and-socket connection,

means electrically insulating the portion of the electrical lead extending outside said edge of the face plies and at least a portion of the electrically conductive lead embedded between the face plies near said edge of the face plies,

means forming a seal around the electrically insulated embedded portion of the electrically conductive lead, and

second electrical connector means for making electrical contact with said electrically resistive heating element.

4,100,399

PROGRAMMED CONTROL FOR EFFECT SPINNING AND TWISTING MACHINES

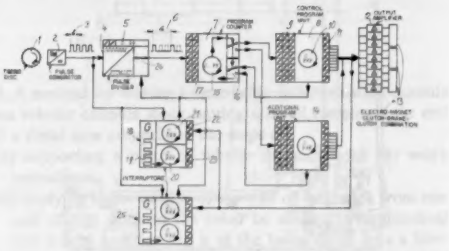
Reinhard Bager, Betzigau, Germany, assignor to Saurer-Allma GmbH, Kempten, Germany

Filed Aug. 31, 1976, Ser. No. 719,214

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 2539341

Int. Cl.² G07C 3/10

U.S. Cl. 235—92 CC **17 Claims**



1. In a twisting and spinning machine, a switching arrangement for producing effect yarns having at least two thread feeding devices, the speed of at least one of said thread feeding devices being selectively controllable, the improvement comprising an electrical pulse generating timing device synchronous with said machine and at least one manually settable and cyclical electrical pulse counter for producing an electrical pulse pattern at the output thereof in response to a preselected number of pulses supplied thereto, a pulse divider circuit connected between said timing device and said electrical pulse counter and being controlled by said timing device, said pulse generating timing device having a characteristic wherein the electrical pulse period of each pulse delivered to said pulse divider circuit corresponds to a unit of length of a thread supply, said pulse divider circuit having the characteristic of altering the effective time interval of pulses delivered to said pulse counter so that the length thereof is different from the time interval of pulses delivered to said pulse divider circuit from said timing device, and speed control means responsive to the output of said pulse counter for selectively altering the speed of said one thread feeding device.

4,100,400

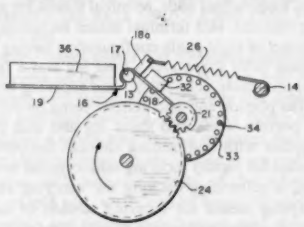
GASOLINE PUMP PRICE ENCODER

John A. Callahan, Houston, and Allan S. Ottenstein, Spring, both of Tex., assignors to RF Products Corp., Houston, Tex.

Filed Sep. 17, 1976, Ser. No. 724,172

Int. Cl.² G06M 1/272; B67D 5/22

U.S. Cl. 235—92 FL **6 Claims**



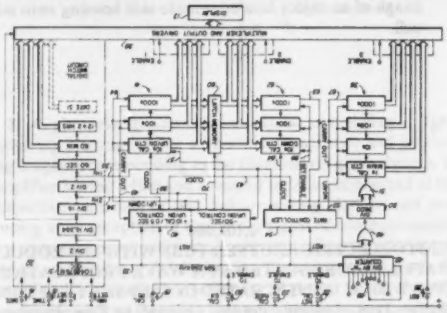
1. In an encoder for use with a flow responsive mechanical computer having a gear which rotates at a rate bearing a predetermined relationship to the flow and a stationary frame member spaced from the gear: a base adapted to be removably mounted on the frame member with a bearing surface for

engagement with said member in such manner that the base is free to pivot about the member, a gear rotatively mounted on the base and spaced from the bearing surface for driving engagement with the computer gear means yieldably urging the base to pivot about the stationary member to maintain the gears in driving engagement when the encoder is mounted on the computer, and means coupled to the encoder gear for delivering a digital output signal corresponding to the rate at which said gear is driven.

4,100,401
CALORIE CALCULATOR-CHRONOMETER

Eugene F. Tutt, and Rita C. Tutt, both of 1501 Nisson Rd., Tustin, Calif. 92680

Filed Jan. 13, 1977, Ser. No. 758,917
Int. Cl.[2] G06M 3/08
U.S. Cl. 235—92 T **4 Claims**



1. In an electronic timepiece having a source of constant frequency signals pulses, a time computing circuit coupled to the source of constant frequency signal pulses and producing time information in binary coded decimal form, an electro-optical digital display, a decoder circuit coupling the time computer circuit to the display, and a first manually operated switch coupled to the time computing circuit for energizing the display from the time computing circuit in response to operation of such first switch, an auxiliary calorie calculator data system including in combination:

a main storage counter for storing numerical data indicative of net calories;

a rate controlling circuit coupling said main counter with said source of constant frequency pulses for decrementing the count in said main counter at a predetermined rate;

an auxiliary digital counter;

means including at least a second manually operated switch coupled with said auxiliary counter and with said source of constant frequency pulses to store a count in said auxiliary counter corresponding to caloric intake, said second switch further being coupled with said auxiliary counter for energizing said display from the output of said auxiliary counter in response to operation of said second switch;

means controlled by said second switch for transferring the count from said auxiliary counter to said main counter to increase the count in said main counter by the amount of the count stored in said auxiliary counter;

calorie rate expenditure circuit means including a third manually operated switch for effecting storage of a count in said auxiliary counter corresponding to the rate of expenditure of calories;

a latch memory circuit coupled with said auxiliary counter and operated by said third switch for storing the count present in said auxiliary counter;

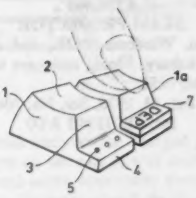
a calorie rate down-counter coupled with said latch memory circuit and with said rate controlling circuit for temporarily storing the calorie count stored in said latch memory circuit and for varying the rate at which the count in the main counter is decremented by said rate controlling circuit directly proportional to the count stored in said latch memory circuit; and

a fourth manually operated switch coupled with said main counter for energizing said display from said main counter in response to operation of said fourth switch.

4,100,402
KEYBOARD KEY WITH CHANGEABLE INDICIA

Goran Lundström, Enskede, and Willem Huijsers, Farsta, both of Sweden, assignors to Hugin Kassaregister AB, Stockholm, Sweden

Filed Nov. 22, 1976, Ser. No. 743,632
Int. Cl.[2] G06C 7/02; B41J 5/16
U.S. Cl. 235—145 R **3 Claims**



1. A key for a keyboard comprising:

a main body portion adapted to be contacted by the operator, the end of the body portion remote from the operator formed with a rear wall defining a recess into which the nail of the operator can extend and terminating in a shelf,

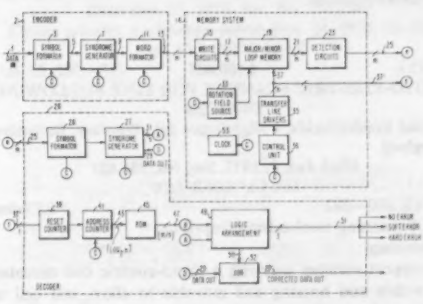
an indicia holding plate mountable on said shelf having a pocket for accepting and holding a label with indicia thereon and an opening into said pocket to permit the label to be exchanged, the top of said plate being transparent to permit the indicia to be viewed,

and mating means on said plate and said shelf for mounting the plate to the shelf.

4,100,403
METHOD AND MEANS FOR DISCRIMINATING BETWEEN SYSTEMATIC AND NOISE-INDUCED ERROR IN DATA EXTRACTED FROM WORD ORGANIZED MEMORY ARRAYS

John Scott Eggenberger, Los Altos, and Arvind Motibhai Patel, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,506
Int. Cl.[2] G06F 11/12; G11C 29/00
U.S. Cl. 235—312 **9 Claims**



1. A method for discriminating between no error, defect induced error, and noise induced error in formatted data normally stored in and extracted from an addressable memory, said data being inclusive of redundancy patterns, the method comprising the steps of:

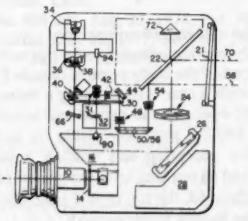
forming a table of concordance between each memory address and its defect status;
accessing both formatted data from at least one preselected memory address and the counterpart defect status from the concordance table;
determining the syndrome of the accessed data; and
indicating from the accessed data the presence of either:
a defect induced error upon the concurrence of a non-zero syndrome and a defect at the counterpart memory address;
a noise induced error upon the concurrence of a non-zero syndrome and no defect; or
no error upon the occurrence of a zero syndrome.

4,100,404

BEAM PROJECTOR

Philip M. Johnson, Windham, N.H., and John D. Kuppenheimer, Jr., Tewksbury, Mass., assignors to Sanders Associates, Inc., Nashau, N.H.

Filed Jul. 13, 1976, Ser. No. 704,894
Int. Cl.[2] H04B 9/00
U.S. Cl. 250—199 **33 Claims**



20. A beam projector, comprising:
a source of radiation;
a plurality of separate coded reticles;
means for sequentially moving said separate coded reticles in the path of the beam of said radiation source;
a pseudo-zoom assembly intermediate said source of radiation and said coded reticles;
a mirror disposed intermediate said pseudo-zoom lens assembly and said coded reticles; and
means for moving said mirror out of the path of said radiation source thereby providing a different optical path between said pseudo-zoom lens assembly and said coded reticles such that the focal length of the projector is thereby altered.

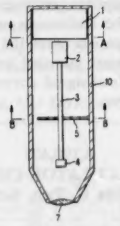
4,100,405

PHOTO-ELECTRIC SCANNER FOR LINE FOLLOWING DEVICES

Michael Kondrollochis, 4 Nightingale Rd., Woodley, Berkshire, England

Filed Jan. 3, 1977, Ser. No. 756,422
Int. Cl.[2] G05B 1/00
U.S. Cl. 250—202 **8 Claims**

1. A scanning mechanism comprising:
a housing;
a support member carrying a photo-electric cell mounted within said housing and movable to allow said cell to move in an elliptical orbit;
electro-magnetic means mounted within said housing;
magnetic means secured to said support and positioned within a moving field producible by said electro-magnetic means, such that on energisation of said electro-magnetic means by a power supply said moving field thereby causes movement of said magnetic means and said cell in said elliptical orbit; and



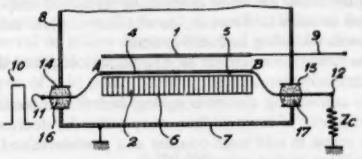
optical means mounted in a wall of said housing to direct an image of an object located outside said housing onto said cell.

4,100,406

PHOTOELECTRIC SHUTTER TUBE WITH MICRODUCT WAFER INCORPORATED IN A WAVE PROPAGATION LINE WHICH IS INTEGRATED IN SAID SHUTTER TUBE

Charles Loty, Lesigny, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 10, 1977, Ser. No. 776,277
Claims priority, application France, Mar. 16, 1976, 76 07489
Int. Cl.[2] H01J 31/50
U.S. Cl. 250—213 VT **7 Claims**



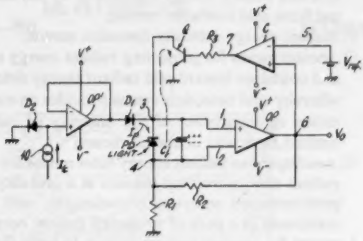
1. A photoelectric shutter tube of the type which essentially comprises in sequence and parallel to each other a photocathode brought to a predetermined electric potential, a secondary-emission microduct wafer, a screen composed of a layer of material which is phosphorescent under the impact of electrons and coated on the wafer side with a so-called screen layer, wherein a metal deposit or so-called wafer layer is applied only on that face of the wafer which is directed towards the photocathode, said wafer layer being brought to a potential which is equal to or higher than that of said photocathode, the space located between wafer and screen layers being so arranged as to provide a wave-propagation line element of the biplanar type in which the conductors are constituted by said layers, the characteristic impedance of said element being equal to that of a propagation line which is located externally of the tube for carrying a pulse signal and to which it is connected, wherein the tube comprises electrically matched means for bringing said line element out through the tube envelope and connecting said element to the external line and wherein a voltage signal is applied to the line element and progressively brings the screen layer to a higher potential than that of the wafer layer.

4,100,407

PHOTOELECTRIC CONVERSION CIRCUIT

Akinori Takahashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,773
Claims priority, application Japan, Jun. 28, 1976, 51-76270
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—214 P 2 Claims



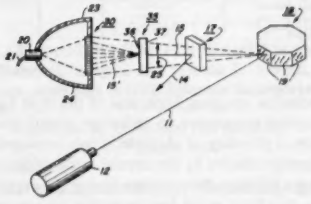
1. A photoelectric conversion circuit comprising a light-receiving element having a parasitic capacitance and producing a signal corresponding to the illumination given thereto, an amplifier having a first and a second terminal connected to the respective terminals of said light-receiving element and producing upon reception of the output signal of said light-receiving element an output voltage corresponding to said output signal, a comparator for comparing the output voltage of said amplifier with a reference voltage, and means for discharging an electric charge stored in said parasitic capacitance of said light-receiving element under the control of the output of said comparator.

4,100,408

SIGNAL GENERATOR FOR RASTER TYPE SCANNERS

Sidney W. Marshall, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 2, 1977, Ser. No. 773,445
Int. Cl.[2] G01D *5/30*
U.S. Cl. 250—230 6 Claims



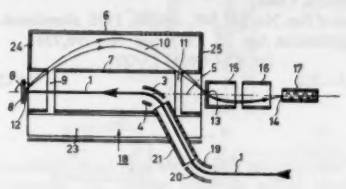
1. In a signal generating apparatus for generating signal pulses in accordance with the sweep of a light beam, the apparatus including aperture means having a succession of spaced apart apertures, the aperture means being astride the path through which the light beam sweeps whereby to produce a succession of light bursts on sweep of the light beam thereacross, and light triggered signal generating means for producing signal pulses in response to the light bursts, the improvement comprising: beam splitting means for separating said light beam into plural secondary light beams, the spacing between said secondary beams being at least equal to the distance between adjoining ones of the apertures in said aperture means, said plural secondary light beams assuring distortion free production of the signal pulses in the event one or more of the apertures in said aperture means are closed or misaligned.

4,100,409

DEVICE FOR ANALYZING A SURFACE LAYER BY MEANS OF ION SCATTERING

Hidde Herman Brongersma, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 577,069, May 13, 1975, abandoned, which is a continuation of Ser. No. 432,483, Jan. 11, 1974, abandoned. This application Nov. 1, 1976, Ser. No. 737,733
Claims priority, application Netherlands, Feb. 3, 1973, 7301496
Int. Cl.[2] H01J *39/00*
U.S. Cl. 250—305 2 Claims



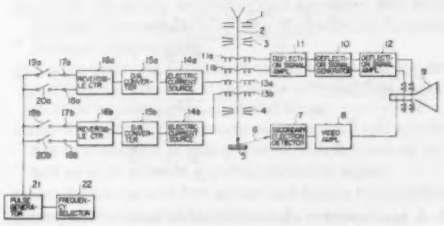
1. In a cylindrical analyzer for charged particles back scattered from a target on the axis of said analyzer, said analyzer including inner and outer concentric electrically conductive tubular electrodes, the inner of said electrodes having longitudinally spaced annular entrance and exit slots for back scattered charged particles, a radial-electric field between said electrodes permitting back scattered charged particles having only a predetermined energy to exit through said exit slot to detector means therefor, the improvement comprising a passageway from the exterior of said analyzer to the interior thereof for cooperation with a primary mono-energetic ion beam source external thereto and deflection means within said analyzer to direct a primary mono-energetic ion beam through said passageway and along the axis of said analyzer for collision with the target on the axis thereof, said passageway comprising: at least two conductive radially aligned longitudinal walls between but spaced from said inner and outer electrodes and defining an acute sector shaped space therebetween, said inner and outer electrodes being absent from at least a portion of the boundary of said sector shaped space to form a passageway from the exterior of said analyzer to the interior thereof, said longitudinal walls being held at a potential between the potentials of said inner and outer electrodes.

4,100,410

APPARATUS FOR SELECTING THE FIELD OF VIEW OF A SAMPLE

Yukichi Ueno, and Toshiaki Nakata, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,206
Claims priority, application Japan, Dec. 24, 1975, 50-153251
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—311 6 Claims



1. Apparatus for selecting the field of view of a sample, comprising means for irradiating the sample by an irradiation beam, means for generating electric pulses, means capable of

counting said electric pulses both incrementally and decrementally and for generating an electric signal corresponding to the number of the counted pulses, means for deflecting said irradiation beam to irradiate said sample in response to said electric signal, and means for stopping the incremental counting and the decremental counting independently.

4,100,411

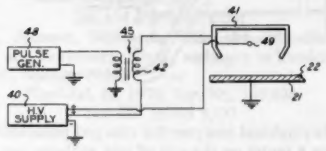
BIASING ARRANGEMENT FOR A CORONA DISCHARGE DEVICE

Thomas G. Davis, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 541,545, Jan. 16, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,725

Int. Cl.[2] G03G *15/00*

U.S. Cl. 250—324 **14 Claims**



1. A corona discharge device comprising

an elongated corona discharge electrode,

a conductive shield disposed in partially surrounding relationship with respect to said electrode, said shield being coextensive with said electrode,

means for applying a high D.C. corona generating potential of a first polarity to said wire,

means for biasing said shield to a first D.C. potential of said first polarity high enough to substantially extinguish ion formation adjacent said electrode, and

means for continuously cyclically changing the potential on said shield at a constant rate to a second fixed potential to increase ion production adjacent said electrode and returning said potential to said extinguishing level the duration and frequency of said cyclical changes on said shield operating to direct a substantial majority of said ions under the influence of an electric field to an adjacent surface other than said shield.

4,100,412

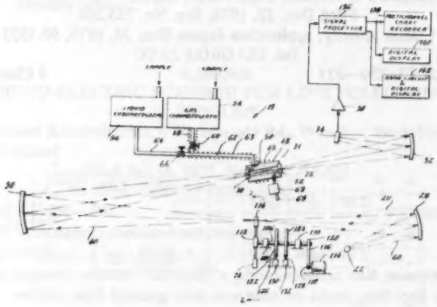
SELECTIVE MULTICHANNEL OPTICAL TIME-SHARED DETECTOR FOR CHROMATOGRAPHY

Harry H. Hausdorff, 270 Westport Rd., Wilton, Conn. 06897

Filed Oct. 29, 1976, Ser. No. 737,106

Int. Cl.[2] G01N *21/34*

U.S. Cl. 250—343 **13 Claims**



1. A nondispersive chromatographic detector comprising:

A. a radiant energy source;

B. flow through sample cell means for positioning a sample for impingement by radiant energy from said source;

C. chromatograph means including a separation means for causing a sample introduced to aid chromatograph to separate into components which elute successively in time from said separations means;

D. means coupling said separation means to said flow through cell;

E. first means for projecting radiant energy from said source toward said container means whereby a sample being analyzed is impinged by radiant energy and absorbs radiation and radiant energy transmitted by the sample is emitted from said container means;

F. radiant energy intensity detection means;

G. second means for projecting radiant energy emitted from said container toward said radiant energy detection means whereby said detection means provides an electrical indication representative of the intensity of radiant energy emitted from said container means;

H. nondispersive radiant energy filter means for transmitting radiant energy incident thereon at a plurality of different predetermined analytical wavelengths, said filter means positioned in a path of projected radiant energy;

I. means for causing radiant energy to periodically be projected at each of said plurality of analytical wavelengths; and,

J. means coupled to said radiant energy detection means for providing a simultaneous indication of the intensity of radiant energy impinging on said detection means at each of said plurality of wavelengths.

4,100,413

RADIATION IMAGING APPARATUS WITH IMPROVED ACCURACY

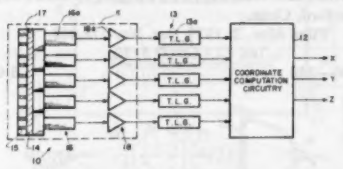
Dan Inbar, Haifa, and Yitzhak Klein, Kiryat Yam, Haifa, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Sep. 14, 1976, Ser. No. 723,305

Claims priority, application Israel, Sep. 17, 1975, 48113

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—366 **9 Claims**



1. In radiation imagimg apparatus of the type having a scintillation crystal responsive to radiation stimuli for producing light events, a plurality of photodetectors arranged in a predetermined array relative to the crystal, each of the photodetectors having a lightsensitive surface facing the crystal and being responsive to a light event for producing an output signal, and coordinate computation circuitry for computing the coordinate of a light event from signals applied thereto, the output signals of each photomultiplier being applied to the coordinate computation circuitry via coupling means associated with each photodetector, the improvement comprising:

(a) a delay circuit in each coupling means for delaying the output signal of the photodetector with which the coupling means is associated;

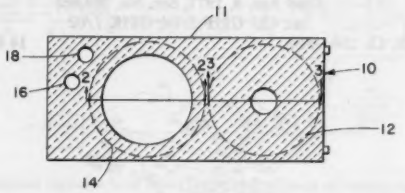
(b) a linear gate in each coupling means for connecting the output of the delay circuit to the coordinate computation circuitry when the gate is activated; and

(c) decision means responsive to the output signal of at least one photodetector for enabling the linear gate of a coupling means when a predetermined condition is met within the delay time of the delay circuits of the coupling means.

4,100,414
METHOD FOR MEASURING DOSE-EQUIVALENT IN A NEUTRON FLUX WITH AN UNKNOWN ENERGY SPECTRA AND MEANS FOR CARRYING OUT THAT METHOD

Carl H. Distenfeld, Mattituck, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 19, 1977, Ser. No. 760,796
Int. Cl.² G01T *3/00, 1/11*
U.S. Cl. 250—391 **13 Claims**



1. A method for measuring the dose-equivalent accumulated by a person during a period of exposure to a neutron flux having an unknown and/or time varying energy spectrum comprising the steps of:

(a) Obtaining a first reading reflecting substantially only that portion of said neutron flux, incident during said periods of exposure, having energies in an upper portion of said energy spectrum,

(b) Obtaining a second reading reflecting both that portion of said flux incident during said periods of exposure and those neutrons backscattered from said person's body during said periods, having energies in a lower portion of said energy spectrum,

(c) Obtaining a third reading reflecting substantially only that portion of said flux, incident during said periods, having energies in said lower portion of said energy spectrum,

(d) Combining said readings by means of a predetermined function of said readings whose value is an approximate measure of the dose equivalent accumulated by said person during said periods which value is substantially independent of said energy spectrum.

4,100,415
MODULAR PHOTOCHEMOTHERAPY CHAMBER

Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 4, 1976, Ser. No. 693,029
Int. Cl.² A61N *5/06*
U.S. Cl. 250—455 **15 Claims**

1. A modular photochemotherapy chamber comprising, in combination:

a substantially horizontal base member;

a plurality of side panel assemblies mounted vertically upright on said base member and arranged to form an enclosure;

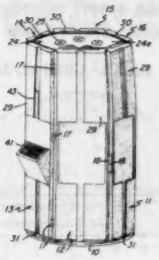
each of said side panel assemblies including a plurality of phototherapy lamps disposed vertically thereon and facing the inside of said enclosure, said lamps being adapted, when energized to emit substantially only ultraviolet light;

means at one end of each of a subplurality of said side panel assemblies for removably attaching the panels to said base member;

a substantially horizontal top member covering said enclosure and removably attached to the other end of each of said subplurality of side panel assemblies;

at least one of said side panel assemblies not of said subplurality thereof being removably attached by hinges to an adjacent side panel assembly to thereby provide a door for said enclosure;

means in said top member for ventilating said enclosure and

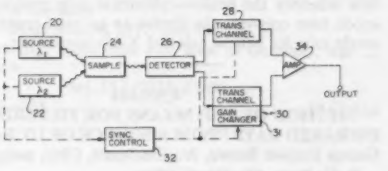


a removable stand disposed on said base member within said enclosure and having reflector means thereon facing toward the top of said enclosure, said stand having a top portion located above the lower ends of said vertically disposed lamps.

4,100,416
SERUM FLUORESCENCE SUPPRESSION

Tomas R. Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Mar. 2, 1977, Ser. No. 773,546
Int. Cl.² G01N *21/38, 33/16;* **G01J** *3/30*
U.S. Cl. 250—461 B **10 Claims**



1. Apparatus for assaying fluorescently-tagged antibody-antigen reaction product contained in a specimen of blood serum, said apparatus comprising in combination:

means for irradiating said specimen with first radiation in the absorption band of the tag of said product so as to stimulate fluorescent emission from said tag;

means for separately irradiating said specimen with second radiation substantially incapable of stimulating fluorescent emission from said tag;

means for detecting fluorescent emission from said specimen due to irradiation of said specimen with said first radiation so as to provide a first electrical signal;

means for detecting fluorescent emission from said specimen due to irradiation of said specimen with said second radiation so as to provide a second electrical signal;

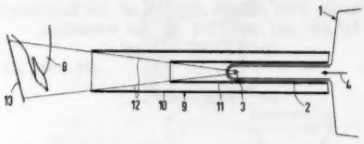
means for scaling said first and second signals with respect to one another by scaling factor; and

means for producing as a function of a difference between said first and second signals as scaled, an electrical output signal related to the amount of said antigen in said specimen.

4,100,417
DENTAL X-RAY DIAGNOSTIC DEVICE

Horst Göetzl, Erlangen; Ulrich Grassme, Nuremberg, and Johannes Seissl, Erlangen-Buckenhof, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, of Germany

Filed Feb. 3, 1977, Ser. No. 765,456
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1976, 2608418
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—505 5 Claims

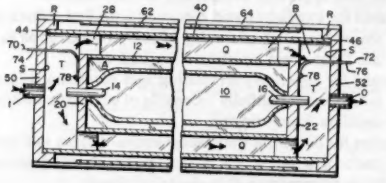


1. In a dental X-ray diagnostic device having an X-ray tube whose cathode is provided with means for focusing the emitted electron beam onto an anode with the anode disposed adjacent a sealed end section of a tube projecting from a housing containing the cathode with the device constructed in such a manner that the X-rays issue from the anode in substantially all directions, the device being equipped with a cap constructed of an X-ray absorptive material which can be slipped over the anode tube, the cap being provided with an aperture restricting the emitted X-ray beam thereby allowing simultaneous X-ray photographs of plurality of teeth by placing the anode interiorly of the mouth of the patient, the improvement of an axially elongated hollow-cylindrical open ended tube constructed of X-ray absorptive material, said tube having an internal dimension, at least at one axial end, receivable over the sealed end section of the anode tube, a frontal axial end of said hollow-cylindrical tube remote from the one axial end being open, and the hollow-cylindrical tube projecting beyond the anode remote from the cathode and being dimensioned to provide an X-ray beam exiting from the open frontal end with a predetermined angle with a central ray laying on the axis of the anode tube whereby the hollow-cylindrical tube positioned on the anode tube converts the device to an axial emitter from the anode tube for patient external X-ray source use.

4,100,418
METHOD OF AND MEANS FOR FILTERING THE INFRARED RAYS FROM A SOURCE OF UV RADIATION

George Emmett Brown, Jr., Cincinnati, Ohio, assignor to Gene D. Hoffman, Cincinnati, Ohio

Filed Mar. 4, 1977, Ser. No. 774,234
Int. Cl.[2] G21K *3/00;* G01J *1/42*
U.S. Cl. 250—510 27 Claims



4. The method of absorbing infrared rays while transmitting cool ultraviolet rays from a source of UV radiation, which comprises the steps of:

(a) housing the source of radiation within a moisture-impervious first chamber in which said source of radiation can operate at its rated operating temperature, said chamber being transparent along the light-emitting length of said UV source to infrared and ultraviolet rays,

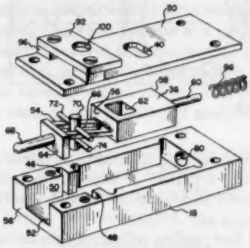
(b) enclosing said first chamber within a second chamber which is transparent along the light-emitting length of said UV source to infrared and ultraviolet rays; and of

(c) introducing steam into and through the second chamber so that the steam forms a filter media which absorbs the infrared rays and transmits the ultraviolet rays from said source of radiation.

4,100,419
SAFETY INTERLOCK DEVICE

Raul Pedroso, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Apr. 5, 1977, Ser. No. 784,663
Int. Cl.[2] G21F *5/04;* G21K *1/02*
U.S. Cl. 250—514 14 Claims



1. A safety interlock device for securing a protective enclosure within which radiation emitting means is employed, the enclosure having an access opening and dislodgeable means for preventing entry to said access opening, the safety interlock device serving to prevent exposure to said radiation when entry is gained to said enclosure: said safety interlock device comprising; a housing receivable within said enclosure, spring-biased shutter means within said housing and capable to block said radiation when said entry is gained, said shutter means movable within said housing between an active blocking condition and a defeated condition permitting passage of such radiation, indicating means coupled to said shutter means to establish visible indication when said shutter means is disposed in blocking condition, latch means secured to said dislodgeable means and being movable in a restricted path adjacent said housing, means defining said restricted path and control means coupled to said shutter means to limit movement of said latch means in said path during the defeated condition of said interlock whereby free entry cannot be obtained while said shutter interlock device is defeated.

4,100,420
DISPLACEMENT TRANSDUCERS

Eric Metcalf, Ropley, England, and Anthony John Ley, Bièvres, France, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Jan. 26, 1977, Ser. No. 763,253
Claims priority, application United Kingdom, Feb. 3, 1976, 04257/76
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—561 15 Claims

1. A displacement transducer comprising:

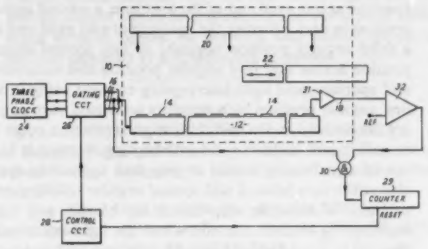
a charge-coupled device having a plurality of light-sensitive stages arranged in a line,

a light source,

an obturating member disposed between the light source and the charge-coupled device, the charge-coupled device and the obturating member being relatively movable in dependence upon the displacement to be transduced so as to vary the amount of light received by, and the charge accumulated in, respective stages of the charge-coupled

device in accordance with the relative positions of the charge-coupled device and the obturating member,

a clock pulse generator for applying clock pulses to the charge-coupled device to successively shift the respective charge in each stage of the device towards an output stage, whereby to produce from said output stage an



output signal whose level takes a succession of values each corresponding to the charge in a respective stage of the device, and

means responsive to said output signal to derive a signal in accordance with the relative positions of the device and the member.

4,100,421

OZONE-GENERATING APPARATUS

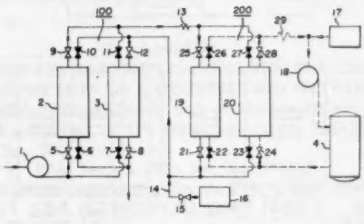
Norikazu Tabata; Takanori Ueno, and Keisuke Namba, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Amagasaki, Japan

Filed Dec. 16, 1976, Ser. No. 751,482

Claims priority, application Japan, Dec. 19, 1975, 50/152521; Jan. 16, 1976, 51/3828; Jan. 19, 1976, 51/4735

Int. Cl.² C01B *13/00*

U.S. Cl. 250—533 **6 Claims**



1. An ozone-generating apparatus which comprises:

an ozonizer;

first and second moisture exchangers, connected to said ozonizer, each containing a synthetic zeolite having a pore diameter of less than 4 Angstroms which adsorbs nitrogen oxides, said exchangers alternately repeating an operation for drying air fed into the ozonizer and an operation for regenerating the moisture adsorbent by the dry ozone-containing air obtained by the ozonizer; and,

means for feeding nitrogen oxides which is operably connected to said first and second moisture exchangers.

4,100,422

LIGHT CONDUCTOR IN A SIGNAL ISOLATOR

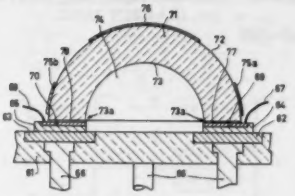
Jacques Claude Thillays, Herouville-St-Clair, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,302

Claims priority, application France, Aug. 29, 1975, 75 26628

Int. Cl.² G02B *27/00*

U.S. Cl. 250—551 **31 Claims**



1. A light conductor, comprising at least one element for conducting light by total reflection, said element being formed from a material having an index of refraction n_1 and has a first main face which bounds an exterior medium having an index of refraction n_2 which is lower than n_1, the first main face having the shape of a part of the surface of a sphere, said part being situated on a side of an arch of a great circle on the sphere, an injection zone of light situated in the proximity of a first end of the arch, a collecting zone of light situated in the proximity of a second end of said arch, the location of the injection and collection zones being such that the distance between each of the collection and injection zones and the center of the sphere being at most equal to the radius of the said sphere and at least equal to the product of the radius of the sphere and the sine of a limit angle equal to the arcsine n_2/n_1.

4,100,423

OPTO-ELECTRONIC TWO-WAY COUPLING

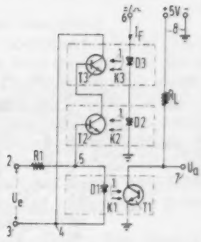
Gerhard Krause, Rosenheim, Egarten, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,661

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614359

Int. Cl.² G02B *27/00*

U.S. Cl. 250—551 **10 Claims**

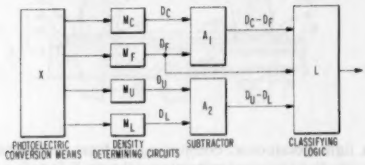


1. An opto-electronic two-way coupling system having a signal input for signal voltages below 1 volt which is electrically separated from the signal output, said system including a first opto-electronic coupler having a transmitter and receiver and connected via its transmitter to the signal input and via its receiver to the signal output, and at least one additional opto-electronic coupler having a transmitter and receiver with a coupling direction opposite to the first coupler, its receiver connected to the signal input and its transmitter connected to a current source separate from the signal output.

4,100,424
METHOD FOR CONTROLLING A PHOTOGRAPHIC PRINTING EXPOSURE

Taizo Akimoto; Takaaki Terashita; Koji Takahashi; Shigeru Watanabe, and Eiichi Asai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara Japan

Filed Aug. 18, 1976, Ser. No. 715,589
Claims priority, application Japan, Aug. 19, 1975, 50-100454
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—559 13 Claims



1. A method for categorizing film negatives for correcting the exposure amount required to make photographic prints from said negatives, said method comprising:

detecting the transmission density of the entire scene of a negative, a central portion of said negative, a first half portion and a second opposite half portion of said negative;

determining the difference values between said densities of said central portion and entire scene to obtain a first difference value and the difference values between said first and second half portions to obtain a second difference value;

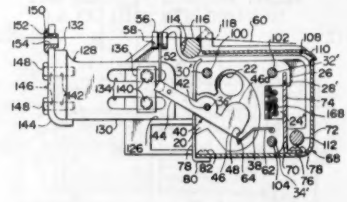
quantizing said first and second difference values and said density of the entire scene into discrete quantized values; and

logically combining said quantized values into exclusive groups corresponding to categories, the particular combination existing for any given negative determining the group and the category of the negative for correction.

4,100,425
APPARATUS FOR DETECTING BREAK OR SLACKENING OF YARN

Shiuji Ohsawa, No. 10-2, 2-chome, Tsutsumi-cho, Kiryu City, Gumma Prefecture, Japan

Filed Dec. 14, 1976, Ser. No. 750,566
Int. Cl.[2] D02H *13/08*; D04B *35/16*
U.S. Cl. 250—561 20 Claims



1. An apparatus for detecting a break or unusual slackening of a yarn in a plurality of yarns, comprising:

a detector assembly consisting of a plurality of detecting units juxtaposed end-to-end in a longitudinal direction, each of the detecting units comprising a magazine block having front and rear ends substantially parallel with said longitudinal direction and formed with an aperture open at both side ends of the magazine block, the apertures in the magazine blocks of the individual detector units having respective center axes substantially in line with one another, said apertures forming an elongated continuous bore throughout said magazine blocks substantially in parallel with said longitudinal direction: a light-intercepting element which is rotatable about an axis of rotation through said magazine block and substantially parallel with said longitudinal direction and which projects outwardly from the front end of the magazine block, the light-intercepting element being rotatable about said axis of rotation between a first angular position uncovering the aperture at one axial end of the aperture, a second angular position in part covering the aperture at said axial end and a third angular position opposite to said second angular position across said first angular position and uncovering said aperture, said light-intercepting element being in said first angular position by a properly tensioned yarn engaging the element and in said third angular position when the detecting unit including the intercepting element is to be out of use; biasing means urging said light-intercepting element to turn toward said second angular position about said axis of rotation; stop means for bearing said light-intercepting element thereon when the light-intercepting element is in said second angular position; and manually-operated retaining means supported on said magazine block for releasably holding said light-intercepting element in said third angular position thereof;

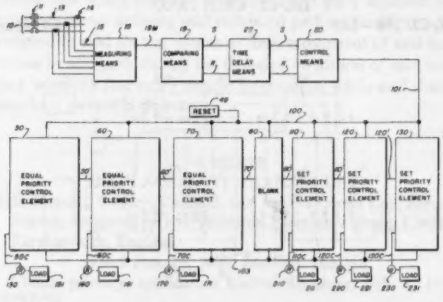
light-emitting means which is positioned externally of and in proximity to the aperture in the magazine block disposed at one longitudinal end of said detector assembly and which is operative to project a beam of light into said bore; and

light-sensitive signal generating means positioned externally of and in proximity to the aperture in the magazine block at the other longitudinal end of said detector assembly and operative to deliver a signal in response to the beam of light emitted from said light-emitting means and reaching said signal generating means through said bore.

4,100,426
LOAD CONTROLLING MEANS

Stephen W. Baranowski, Fairfield, Conn., and Richard H. McConeghy, Milwaukee, Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Mar. 10, 1976, Ser. No. 665,655
Int. Cl.[2] H02J *3/00, 3/14*
U.S. Cl. 307—41 7 Claims



1. A demand controller for an electrical power system of the type connecting and disconnecting electrical loads from an electrical source to control the level of electrical power consumption comprising:

a sensing means responsive to the current in the power system for producing a first output signal when the current is above a first preselected level for a preselected time and a second output signal when the current is below a second preselected level for a preselected time;

a first group of control elements each connected to respectively control each of a first group of loads and having a means responsive to control signals for connecting and

disconnecting its loads in a preselected first priority sequence;

a second group of control elements each connected to respectively control each of a second group of loads and having a means responsive to control signals for connecting and disconnecting its loads in a preselected second priority sequence; and

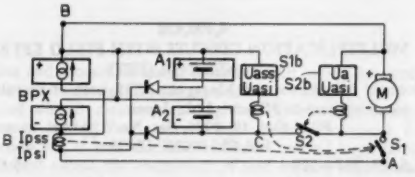
a control means responsive to the first output signal and the second output signal for producing and selectively delivering control signals to the first and second group of control elements in a preselected sequence.

4,100,427

DEVICE FOR CONVERTING SOLAR ENERGY

Henri Durand, Paris, and Geert Jan Naaijer, Limeil-Brevannes, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1976, Ser. No. 734,995
Claims priority, application France, Oct. 31, 1975, 75 33378
Int. Cl.² H02J *1/10*
U.S. Cl. 307—87 **9 Claims**



1. In a device for converting solar energy into electric energy to be supplied to a load of the type which exhibits an in-rush effect, the improvement comprising, a plurality of photocells for converting solar energy into electric energy, a plurality of electric accumulators for storing electric energy supplied by the photocells, the number of photocells being sufficient to provide a peak power and a peak photocell current which under optimum insolation is equal to or is slightly greater than the nominal power and the nominal current, respectively, of the load, means for coupling the photocells to the accumulators and the load, switching means for connecting the load, during the load starting period, to the photocells only so that the load current then is determined only by the photocell current, and detection means responsive to photocell current, load voltage and accumulator voltage for controlling the operation of said switching means.

4,100,428

CONTROL SYSTEM FOR LIMITING THE ELECTRICAL CONSUMPTION OF A DISTRIBUTION NETWORK

Jules Delisle; Adrien Leroux, both of Sherbrooke, and Serge Mathieu, Ste-Foy, all of Canada, assignors to H.O.P. Consulab Inc., Beauport, Canada

Filed Jun. 15, 1976, Ser. No. 696,415
Claims priority, application Canada, Feb. 6, 1976, 245766
Int. Cl.² H05B *1/02;* **H01H** *37/00*
U.S. Cl. 307—97 **14 Claims**

1. A control system for limiting the electrical demand of a distribution network to a maximum predetermined value while regulating the temperature of one or more thermal loads by connecting and disconnecting a number of heating or cooling elements, comprising:

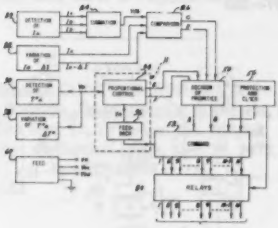
means for measuring the instantaneous demand of said network;

means for comparing the measured demand of said network to said predetermined maximum value;

means for measuring the instantaneous temperature of each said thermal load;

means for determining, for each said thermal load, the difference between the measured temperature and a precetermined temperature for said load;

means for establishing a proportional relation between said difference and the number of elements in a connected state;



priority decision means for determining action to be taken on the connection or disconnection of a number of said elements in response to information received from said comparing means and said relation establishing means: and

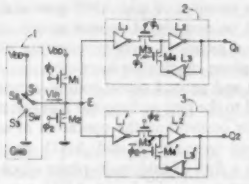
means for connecting or disconnecting said number of said elements in response to a decision derived from said priority decision means.

4,100,429

FET LOGIC CIRCUIT FOR THE DETECTION OF A THREE LEVEL INPUT SIGNAL INCLUDING AN UNDETERMINED OPEN LEVEL AS ONE OF THREE LEVELS

Yoshio Adachi, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 20, 1976, Ser. No. 752,141
Claims priority, application Japan, Jan. 7, 1976, 51-784
Int. Cl.² H03K *19/08, 19/40, 17/18, 3/353*
U.S. Cl. 307—205 **17 Claims**



1. A logic circuit comprising

(a) a first power source and a second power source having a lower voltage level than said first power source;

(b) a first and a second switching means, each having an input, an output and a control electrode, said first and second switching means being connected in series between said first and second power sources;

(c) means for generating a three-level input having a first level, a second level and an open level, said three-level input being applied to a junction point of said first and second switching means;

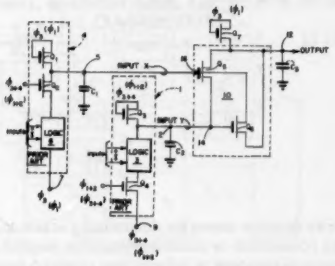
(d) means for generating a first clock pulse signal and a second clock pulse signal out of phase from said first clock pulse signal, said first and second clock pulse signals being applied to the control electrodesof said first and second switching means so as to control the switching operation of said first and second switching means;

wherein the three levels of said three-level input can be detected by obtaining outputs corresponding to said first and second levels when the level of said input is at said first and second levels, and by obtaining, when said level of said input is at said open level, said first level on reception of said first clock pulse and said second level on reception of said second clock pulse.

4,100,430
MULTI-PHASE AND GATE

Mark B. Lesser, Laguna Niguel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 7, 1977, Ser. No. 774,714
Int. Cl.² H03K *19/22, 19/08*
U.S. Cl. 307—205 9 Claims



1. An AND gate having input and output terminals and comprising:

first and second multi-terminal semiconductor devices, each of said multi-terminal devices having respective control and conduction path electrodes;

a control electrode of a first of said multi-terminal semiconductor devices connected to a first conduction path electrode of the second of said multi-terminal semiconductor devices at a first input terminal of said AND gate;

a control electrode of said second multi-terminal semiconductor device connected to a first conduction path electrode of said first semiconductor device at a second input terminal of said AND gate;

a second conduction path electrode of each of said first and second semiconductor devices connected together at an output terminal of said AND gate and

first and second signal source means connected to clock terminal means to receive recurring clock signals having multi-phase clock time intervals;

said first and second signal source means respectively connected to the first and second input terminals of said AND gate for controlling the operation of said AND gate;

the output terminal of said AND gate being precharged during a first of said multi-phase clock intervals;

the output terminal of said AND gate conditionally discharged via the first of said signal source means during a second of said multi-phase clock intervals;

the output terminal of said AND gate electrically isolated from the first and second input terminal means thereof and the first and second signal source means during a third of said multi-phase clock intervals;

the output terminal of said AND gate conditionally discharged via the second of said signal source means during a fourth of said multi-phase clock intervals; and

the output terminal of said AND gate electrically isolated from the first and second input terminal means thereof and the first and second signal source means during fifth and sixth of said multi-phase clock intervals.

4,100,431
INTEGRATED INJECTION LOGIC TO LINEAR HIGH IMPEDANCE CURRENT INTERFACE

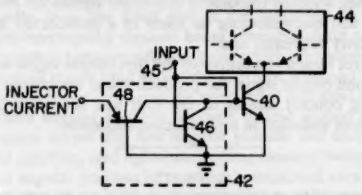
James Jacob Stipanuk, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 7, 1976, Ser. No. 730,415
Int. Cl.² H03K *19/08;* H03F *31/4;* H02J *1/04;* H03F *3/45*
U.S. Cl. 307—213 6 Claims

1. An integrated circuit comprising:

(a) an I^2L circuit having a predetermined breakdown voltage and including a first output transistor having current level I flowing therethrough,

(b) a linear circuit adapted to be coupled to a voltage supply, and

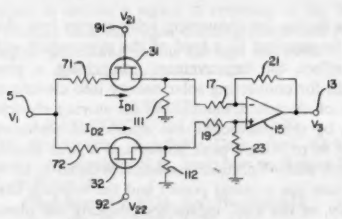


(c) an interface circuit coupled to said first output transistor of said I^2L circuit and to said linear circuit, and including means for maintaining said first output transistor out of breakdown and for generating a predetermined current level IA at said linear circuit, where A is a constant.

4,100,432
MULTIPLICATION CIRCUIT WITH FIELD EFFECT TRANSISTOR (FET)

Nobuaki Miyakawa, and Masayuki Miki, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 19, 1976, Ser. No. 733,841
Int. Cl.² H03K *17/00*
U.S. Cl. 307—229 5 Claims



1. In a multiplication circuit having a field effect transistor, the drain and gate electrodes of which are supplied with first and second input signals to be multiplied, respectively, the improvement comprising:

a pair of field effect transistors, the drain electrodes of which are supplied in common with the first input signal and the gate electrode of one of which is supplied with the second input signal, the gate electrode of the other field effect transistor being kept at a constant voltage,

resistor means connected to the respective drain electrodes, the resistance value of said resistor means being such that the gradient of the characteristic of the drain current to the first input signal is substantially equal to that of the characteristic of the drain current to the second input signal, and

a differential amplifier having two input terminals which are supplied with the signals corresponding to the drain currents of said field effect transistors respectively.

4,100,433
VOLTAGE TO CURRENT CONVERTER CIRCUIT

William Thomas Duffy, and William Joseph Lillis, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

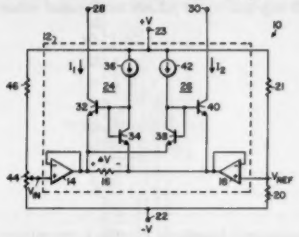
Filed Jan. 4, 1977, Ser. No. 756,922
Int. Cl.² G06G *7/12, 7/24*
U.S. Cl. 307—229 13 Claims

1. A voltage to current converter circuit, comprising:

circuit means adapted to receive both a reference potential

and a linear input voltage for establishing a difference voltage across first and second output terminals thereof, the magnitude of said difference voltage being a linear function of the magnitude of said linear input voltage;

first circuit means including first electron control means having first, second and control electrodes for producing at said second electrode a first logarithmic current signal, the magnitude of said first logarithmic current signal being caused to vary as said magnitude of said difference voltage is varied, said first and control electrodes of said first electron control means being coupled respectively to said



first and second terminals of said circuit means for establishing a differential voltage; and

second circuit means including second electron control means having first, second and control electrodes for producing at said second electrode a second logarithmic current signal, the magnitude of said second logarithmic current signal having a slope thereto which is opposite in polarity to the slope of said first current signal, said first and control electrodes of said second electron control means being coupled respectively to said second and first terminals of said circuit means for establishing a difference voltage.

4,100,434

GATE CONTROLLING APPARATUS FOR A THYRISTOR VALVE

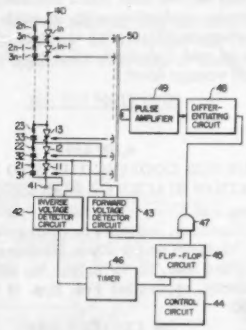
Ryuji Iyotani; Atsumi Watanabe; Hisao Amano, and Fumio Ogata, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 24, 1976, Ser. No. 669,751

Claims priority, application Japan, Apr. 7, 1975, 50-41305

Int. Cl.² H03K *17/14*

U.S. Cl. 307—252 L **12 Claims**



1. A gate controlling apparatus for a thyristor valve composed of a plurality of series connected thyristors having different storage characteristics, comprising first means for judging whether a gate signal is to be applied to each of the thyristors in said thyristor valve, second means connected across a single selected one of said thyristors which has the smallest storage charge under equal temperature conditions among said thyristors in said thyristor valve for detecting a forward voltage thereacross, AND means for generating an output at a time when an AND condition between the respective outputs of said first and said second means is satisfied, and pulse amplifier means for providing a narrow gate signal to each of said thyristors of said thyristor valve in response to the output of said AND means.

4,100,435

PHASE CONTROL APPARATUS

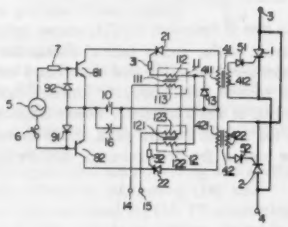
Katsu Komuro, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 13, 1976, Ser. No. 749,962

Claims priority, application Japan, Dec. 25, 1975, 50-156250

Int. Cl.² H03K *5/15*

U.S. Cl. 307—262 **17 Claims**



1. A phase control apparatus comprising:

a synchronizing signal source;

first and second switching devices adapted to be alternately switched by said synchronizing signal source;

a D.C. power supply;

first and second magnetic phase shifters each having a saturable core, an A.C. winding, and a control winding, and A.C. and control windings being wound on said core;

a first load connected in a first closed circuit including said D.C. power supply, said first switching device, and said A.C. winding of said first magnetic phase shifter; and

a second load connected in a second closed circuit including said D.C. power supply, said second switching device, and said A.C. winding of said second magnetic phase shifter;

wherein pulses having predetermined phase angles with respect to the phase angle of the signal from said synchronizing signal source are applied to said first and second loads, said phase angles being determined in accordance with the occurrence of saturation of said saturable cores in said first and second magnetic phase shifters.

4,100,436

CURRENT STABILIZING ARRANGEMENT

Rudy Johan van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,360

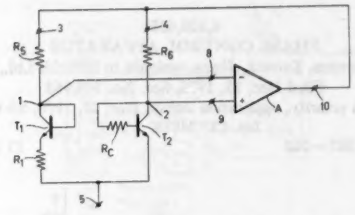
Claims priority, application Netherlands, Oct. 21, 1975, 7512311

Int. Cl.² H03K *17/00*

U.S. Cl. 307—296 R **8 Claims**

1. A current stabilizing arrangement comprising a first voltage control circuit connected between a first point and a first common point, which circuit includes the series connection of a first forward biassed semiconductor junction and a first impedance element, a second voltage control circuit connected between a second point and said first common point, which circuit includes a second forward biassed semiconductor junction, the first and second semiconductor junctions being formed on one semiconductor substrate, a first current path connected between a third point and the first common point, which path also includes said series connection of a first semi-

conductor junction and a first impedance element, a second current path connected between a fourth point and the first common point, which path also includes the second semiconductor junction, a first means for maintaining currents in a mutually fixed ratio in the first and the second current paths so that the arrangement has a stable state for which currents flow



in both current paths, and a second means for maintaining equal voltages across the first and the second voltage control circuits, the second semiconductor junction being the base-emitter junction of a first transistor whose main current path is included in the second current path, and a resistor connected between the base of the first transistor and the second point.

4,100,437

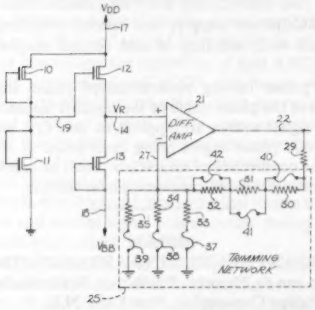
MOS REFERENCE VOLTAGE CIRCUIT

Marcian E. Hoff, Jr., Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jul. 29, 1976, Ser. No. 709,719

Int. Cl.² H03K *3/26*

U.S. Cl. 307—297 **13 Claims**



1. An MOS reference voltage circuit disposed on a substrate and employing devices of the same conductivity type comprising:

an enhancement mode device having a first threshold voltage coupled to receive a first current;

a depletion mode device having a second threshold voltage said second threshold voltage being different than said first threshold voltage said depletion mode device coupled to receive a second current;

circuit means for subtracting one of said first and second threshold voltages from the other of said first and second threshold voltages;

whereby the difference in threshold voltages provides a temperature stable reference voltage.

4,100,438

COMPOUND TRANSISTOR CIRCUITRY

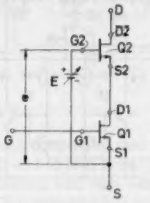
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 14, 1975, Ser. No. 604,762

Claims priority, application Japan, Aug. 21, 1974, 49-95897; Aug. 21, 1974, 49-95900

Int. Cl.² H03F *3/16*; H03K *3/353*; H01L *29/80*

U.S. Cl. 307—304 **20 Claims**



1. A compound transistor circuitry comprising:

a first field effect transistor having a gate electrode, a source electrode and a drain electrode and having a saturated-type output characteristic resembling that of a pentode vacuum tube;

a second field effect transistor having a gate electrode, a source electrode and a drain electrode and having an unsaturating-type output characteristic resembling that of a triode vacuum tube and being connected in series to the drain current path of said first field effect transistor;

a first terminal connected to the gate electrode of said first field effect transistor;

a second terminal connected to the source electrode of said first field effect transistor;

a third terminal connected to the drain electrode of said second field effect transistor; and

a biasing voltage source connected between said gate electrode of said second field effect transistor and said second terminal for providing a biasing voltage across said gate electrode of said second field effect transistor and said second terminal,

said first field effect transistor having a conducting channel of a certain conductivity type which is identical with the conductivity type of the conducting channel of said second field effect transistor,

said biasing voltage having a magnitude and a polarity enabling said second field effect transistor only to become and remain conductive with its said unsaturating-type output characteristic during the state of the drain-source voltage of said first field effect transistor exceeding its pinch-off voltage level.

4,100,439

APPARATUS FOR COOLING THE END ZONES OF THE LAMINATION STACKS OF ELECTRIC MACHINES

Jöachim Boer, and Georg Frankenhauser, both of Mulheim an der Ruhr, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Germany

Filed Mar. 10, 1976, Ser. No. 665,535

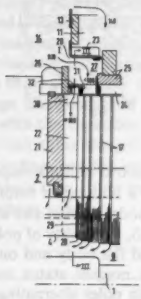
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1975, 2514255

Int. Cl.² H02K *9/08*

U.S. Cl. 310—57 **3 Claims**

1. In an electrical machine having stator lamination stacks surrounding and spaced from a rotor, the stacks and the rotor defining a machine gap therebetween, radial pressure fingers engaging respective end laminations of the stacks, respective pressure plates clamping the pressure fingers and the stator lamination stacks therebetween, a housing having a space therein surrounding the stator lamination stacks, radial parti-

tions spaced-apart in axial direction of the housing and subdividing the housing space into respective end spaces and a plurality of cooling-gas inlet chambers intermediate thereto, radial channels provided in the stator lamination stacks and connecting the cooling-gas inlet chambers to the machine gap, and blower means for producing a cooling-gas flow from the end spaces, wherein maximum blower pressure prevails, axially through the cooling-gas inlet chambers, radially inwardly through the radial channels and axially outwardly through the machine gap, a device for intensively cooling the end zones of the stator lamination stacks comprising, in vincinity of the end zones of the stator lamination stacks, a cooling-gas distributor



chamber separated from the cooling-gas inlet chambers and disposed concentrically to and between the cooling-gas inlet chambers and the stator lamination stacks, said cooling-gas distributor chambers being connected, in parallel with the cooling-gas inlet chambers, to the end spaces, respectively, and to the machine gap, said parallel connection including additional radial channels defined by the respective pressure fingers, the respective pressure plates and the respective end laminations of the stacks and communicating with said cooling-gas distributor chambers so as to receive therein coolant gas for intensely cooling the end laminations directly from the end spaces wherein the maximum blower pressure prevails.

4,100,440

ALTERNATOR-RECTIFIER-REGULATOR UNIT OR MUSHROOM SHAPE FOR VEHICULAR SERVICE

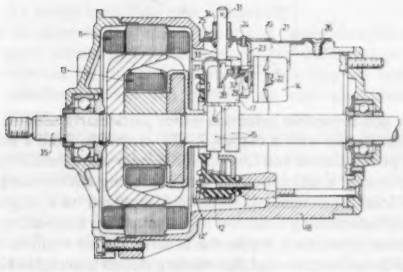
Georg Binder, Stuttgart; Rolf Lindauer, Illingen; Rudiger Sohnle, Stuttgart, all of Germany, and Harald Wahler, Laval, France, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 580,080, May 22, 1975, abandoned. This application Aug. 25, 1976, Ser. No. 717,766

Claims priority, application Fed. Rep. of Germany, May 22, 1974, 2424788

Int. Cl.[2] H02K *5/00*

U.S. Cl. 310—89 **4 Claims**



1. Mechanically powered electric current supply unit suitable for vehicular service comprising a multiphase alternator having a stator provided with a multiphase winding, a rotor provided with an excitation winding, slip rings connected to the excitation winding, and a brush holder provided with brushes therein making contact respectively with said slip rings, rectifying means connected to said multiphase winding and voltage regulating means connected to said rectifying means for regulation of the d.c. output voltage of said unit, and incorporating the improvement consisting, in combination, in that:

said alternator, rectifying means and voltage regulating means are contained in a mushroom-shaped casing (**18**) having an elongated and substantially cylindrical stem portion and a head portion of shorter axial length and larger diameter than said stem portion;

said brush holder (**17**) of said alternator and said voltage regulating means (**14**) are combined into a unitary physical structure forming a component of said unit and located in said stem portion of said casing;

said rectifying means (**12**) are mounted in said stem portion of said casing (**18**);

the stem portion of said casing (**18**) is provided with a lateral aperture (**19**) of a size, shape and location suitable for insertion and removal of said unitary physical structure (**14, 17**) containing said brush holder and said voltage regulating means;

a cover (**21**) is provided fully covering said aperture (**19**) and removably affixed to said casing (**18**), and

said unitary physical structure (**14, 17**) containing said brush holder and said voltage regulating means is fastened to said cover (**21**), while said rectifying (**12**) means are fastened directly to said casing (**18**) independently of the fastening of said cover (**21**) to said casing (**18**), whereby said unitary structure and said cover together are removable from said casing independently of said rectifying means.

4,100,441

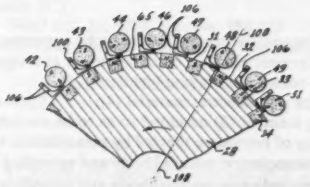
MAGNETIC TRANSMISSION

Alfred Landry, 7589 Caluveado St., Lemon Grove, Calif. 92045

Filed Mar. 18, 1977, Ser. No. 779,159

Int. Cl.[2] H02K *49/06*

U.S. Cl. 310—103 **3 Claims**



1. An improved magnetic transmission having an output shaft, a free-rotating armature carried by the output shaft, a plurality of permanent magnets carried by said armature, said permanent magnets carried by said armature being magnetically oriented with each adjacent magnet having opposite magnetic polarities, a plurality of drive rotor permanent magnets rotatably mounted on an axis, each drive rotor axis having a fixed radial position with respect to the output shaft and disposed in magnetic proximity with said permanent magnets carried by the armature, and an input drive means coupled to said rotor permanent magnets for rotating said drive rotor permanent magnets in a synchronous relationship, said drive rotor permanent magnets being magnetically oriented for rotating the armature at a speed proportional to the rotating speed of said drive rotor permanent magnets, said permanent magnets carried by the armature and said drive rotor permanent magnets being disposed in discrete sectors in 360°, said

permanent magnets carried by the armature having an odd number in each sector and the drive rotor magnets have one less than the odd number in each sector, said improvement comprising, diamagnetic material positioned between each of said drive rotor permanent magnets and said armature and closely related thereto for diminishing at least a portion of the magnetic forces between said rotor permanent magnets and said permanent magnets carried by said armature, said diamagnetic material is positioned so that only the magnetic force between each of said permanent magnets opposing the rotational direction of said armature is effected.

4,100,442

ELECTRICALLY DRIVEN OSCILLATING CAPACITOR DEVICE

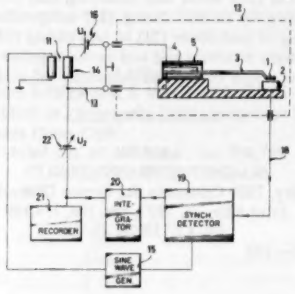
Karl Heinz Besocke, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Mar. 21, 1977, Ser. No. 779,837

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613528

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—317 **9 Claims**



1. An electrically driven Kelvin probe apparatus for operation as a dynamic electron electrometer or as a contact potential meter comprising, in combination:

a body of piezoelectric material (4);

a spring member (3) mounted so as to be excitable at a frequency of resonance thereof by piezoelectric vibration of said piezoelectric material body and extending away from said piezoelectric material body and providing a movable capacitor electrode (1) at or on a portion of said spring member at a distance from said piezoelectric material body;

means for holding a fixed capacitor electrode (2), of a material to be observed, in spaced proximity to said movable capacitor electrode (1) provided by or on said spring member (3);

a vacuum enclosure, capable of being evacuated to a high vacuum, enclosing said body of piezoelectric material, said spring member and said holding means as well as any electrode (2) held by said holding means;

means (7–11; 15) for applying an alternating voltage of a frequency of resonance of said spring member through said enclosure to said piezoelectric material body so as to cause said piezoelectric material body to vibrate said spring member at said frequency, and

means (16) for superimposing a d-c voltage component on said applied alternating voltage.

4,100,443

ELECTRICAL ROTARY MACHINE

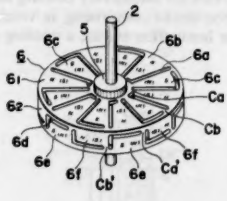
Tomohisa Kuwako, Anjo, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Jun. 9, 1976, Ser. No. 694,334

Claims priority, application Japan, Aug. 13, 1975, 50-98327

Int. Cl.[2] H02K *21/36*

U.S. Cl. 310—164 **9 Claims**



1. A plural phase electric motor comprising a rotary shaft rotatably supported in a housing, a rotor means of magnetic material having a flat body portion and a peripheral side portion secured to said shaft, a plurality of pole means at angularly spaced positions on said flat body and on said peripheral side portions, a permanent magnet stator means magnetized to provide north and south poles alternating at angular spacings corresponding to the angularly spaced positions of said pole means, a plurality of annular exciting coils corresponding in number to the number of phases of the motor, and a yoke member of magnetic material, said yoke member, exciting coils, stator means being so positioned relative to said rotor that magnetic fluxes developed by the exciting coils form respectively a magnetic loop together with the pole means of said flat body portion and a magnetic loop together with the pole means of said peripheral portion of said rotor.

4,100,444

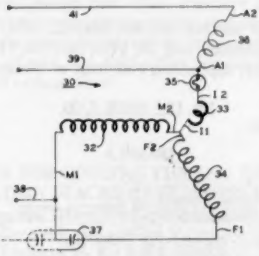
DYNAMOELECTRIC MACHINE WINDING ARRANGEMENT

John H. Boyd, Jr., DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sep. 29, 1975, Ser. No. 617,687

Int. Cl.[2] H02K *3/00*

U.S. Cl. 310—184 **36 Claims**



1. A non-reversible induction motor particularly adapted for interconnection with a capacitor, for excitation from a single phase power source and for rotation in only one direction; said motor having a magnetic core and a winding circuit comprising at least three winding subcircuits arranged on a magnetic core for establishing a number of instantaneous magnetic poles when the capacitor is connected in series circuit relation with one of the subcircuits and the winding circuit is energized by a single phase power source; the winding circuit including first, second, and third winding phases each of which include winding turns for establishing spaced apart instantaneous magnetic

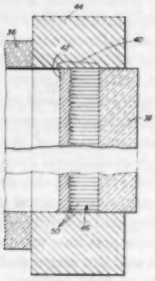
polar regions; the winding turns of the first, second, and third winding phases being arranged circumferentially around the magnetic core so that the effective centers of next adjacent instantaneous magnetic polar regions of opposite instantaneous polarity of each given winding phase are spaced apart 180 electrical degrees around the core, and so that the effective centers of next adjacent successive ones of the instantaneous magnetic polar regions of the first, second, and third winding phases are spaced apart 60 electrical degrees around the core; wherein at least one of the winding phases is comprised of coil group winding turns that are arranged for establishing at least one real pole and at least one consequent pole; wherein the first winding phase is a primary phase winding comprising wire of a first size, the second winding phase is a capacitor winding comprising wire of a second size smaller than said first size, and the third winding phase is an intermediate phase winding comprising wire of a third size larger than said first size; and wherein said windings each comprise a different number of effective wire turns with the capacitor phase winding having more effective turns than either the primary phase winding or intermediate phase winding, and the intermediate phase winding has less effective turns than either the primary phase winding or the capacitor phase winding.

4,100,445

IMAGE OUTPUT SCREEN COMPRISING JUXTAPOSED DOPED ALKALI-HALIDE CRYSTALLINE RODS

Joseph R. Suffredini, Darien, Conn., and Robert A. Hagar, Saratoga, Calif., assignors to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Mar. 15, 1976, Ser. No. 666,843
Int. Cl.² H01J *39/18*
U.S. Cl. 313—101 **2 Claims**



1. An image intensifier tube comprising:

an envelope having spaced input and output faceplates; an input screen means disposed within the envelope and adjacent the input faceplate for receiving an incident radiational image and emitting an equivalent electron image; and

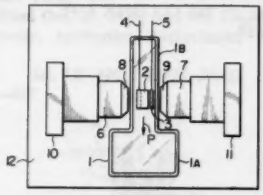
an output imaging screen means aligned with said input screen means and disposed adjacent the output faceplate for receiving the electron image and producing a corresponding visible light image, the imaging screen means including a layer of juxtaposed crystalline rods disposed axially with respect to the output faceplate in tightly packed side-by-side relationship to a packing density greater than seventy percent of the theoretical maximum value, said crystalline rods being doped alkali-halide material.

4,100,446

LIGHT SOURCE LAMP WITH PARTICULAR ENVELOPE STRUCTURE TO ACCOMMODATE EXTERNAL MAGNETS

Katsuhito Harada; Hideaki Koizumi, and Konosuke Oishi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed May 30, 1974, Ser. No. 474,812
Claims priority, application Japan, Jun. 1, 1973, 48-60923
Int. Cl.² G01J *3/30*; H01J *61/067, 61/33, 1/50*
U.S. Cl. 313—161 **14 Claims**



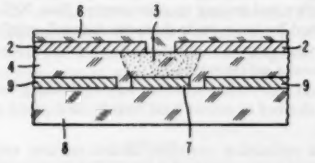
1. A lamp comprising a bulb filled with discharging gas, a cathode and an anode disposed in said bulb opposite to each other, an electric power source to cause electric discharge between said cathode and anode so as to produce spectrum of light, and magnets to induce magnetic field to split the spectrum of light, wherein said bulb has at least one transparent portion through which the spectrum of light is taken out, said magnets are disposed outside said bulb and near that portion of said bulb which surrounds said cathode and anode, and the dimension of said portion of said bulb near said magnets in the direction of said magnetic field of said magnets is smaller than at least one of both the dimension of said portion of said bulb near said magnets in any direction not parallel to that of said magnetic field and the dimension of at least one portion of said bulb except said portion of said bulb near said magnets, said cathode being a hollow cathode.

4,100,447

ADDRESSING OF GAS DISCHARGE DISPLAY DEVICES

Frank Tsui, and Katherine Tsui, both of Holzgerlingen, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 23, 1975, Ser. No. 598,223
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1974, 2435745
Int. Cl.² H01J *61/00*
U.S. Cl. 313—217 **20 Claims**



1. A gas discharge display device structure of the type having a discharge chamber containing ionizable gas sealed therein, said chamber enclosed by a pair of parallel planar layers held in an enclosing spaced relationship by a circumferential seal, said chamber containing a matrix of coordinate addressable discharge gaps formed by a plurality of pairs of electrodes, a first electrode of each pair of said pairs of electrodes being mounted on one layer of said pair of planar layers and said other electrode of said pair being mounted on the other layer of said pair of planar layers in juxtaposition to said first electrode, the improvement comprising:

at least some portion of said layers being of low conductivity

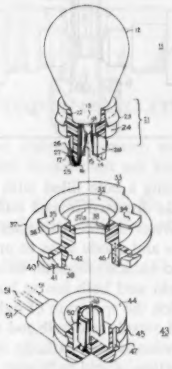
and electrically connecting said electrodes to sustain voltage supply lines for decoupling capacitively induced firing voltages and extinguishing voltages generated on one of said electrodes from others of said electrodes which are also connected to said sustain voltage supply lines.

4,100,448

LAMP AND SOCKET ASSEMBLY

Russell W. Chipner, South Euclid, and James C. Graff, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 2, 1977, Ser. No. 793,049
Int. Cl.[2] H01K *1/44*
U.S. Cl. 313—318 **9 Claims**



5. A lamp and socket assembly having at least one filament within a sealed vitreous envelope from which lead wires for the filament extend at the sealed end of the envelope and a base attached to said envelope, said base being suitable for front or rear insertion into a panel or reflector and comprising:

a first cylindrical member having an enlarged inside diameter portion for receiving the sealed end of said envelope and for establishing the axial position of said envelope with respect to said base, said first cylindrical member further having contact means extending axially away from said envelope to which said lead wires are attached;

a second cylindrical member having an inside diameter greater than the outside diameter of said first cylindrical member;

a first annular ring, encircling said first cylindrical member, for establishing the axial position of the second cylindrical member with respect to the first;

a second annular ring, encircling said second cylindrical member and having an area greater than 50% of the area defined by the outside diameter thereof, axially located at a predetermined position with respect to said one filament to form a reference plane;

a second cylindrical member having locking tabs at either end thereof to secure said base to said panel or reflector; and

a third cylindrical member, closed on one end, having a plurality of conductive contacts aligned with said contact means, said third cylindrical member fitting within said second cylindrical member to engage and enclose said contacts.

4,100,449

UNIFORM FILAMENT AND METHOD OF MAKING THE SAME

Robert Allen Gange, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,865
Int. Cl.[2] H01J *1/20, 19/14*
U.S. Cl. 313—337 **22 Claims**

1. An electron filament, which comprises:

a cylindrical body of refractory metal, said body being substantially uniform in cross section about its longitudinal axis, and

a layer of emissive material concentrically disposed on and

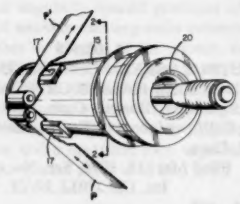
around said cylindrical body and along the longitudinal axis thereof with said layer being substantially uniform in thickness.

4,100,450

METHOD OF AND APPARATUS FOR GENERATING LONGITUDINAL STRIPS OF ENERGETIC ELECTRON BEAMS

William A. Frutiger, and David E. Overberg, both of Beverly, Mass., assignors to Energy Sciences Inc., Bedford, Mass.

Filed Feb. 17, 1977, Ser. No. 769,535
Int. Cl.[2] H03J *33/02;* H05H *7/06*
U.S. Cl. 313—360 **12 Claims**



1. Apparatus for generating a longitudinal strip of energetic electrons having, in combination, a longitudinally extending electron-emitting cathode; a plurality of conductive longitudinally extending cylindrical means mounted substantially coaxially with the cathode and concentrically disposed thereabout at successive spaced radial separations therefrom, each being provided with narrow longitudinal slot means substantially radially aligned with one another; means for applying a positive potential to the innermost of the cylindrical means to control the extraction of electrons from the cathode and their egress as a longitudinal electron beam strip through the narrow slot means of the innermost cylindrical means; evacuated housing means surrounding said plurality of cylindrical means and provided with electron-pervious window means substantially radially aligned with said slot means and means for establishing an accelerating-voltage field between the outermost of the cylindrical means and the housing window means; and means for electrically connecting said cylindrical means together and relatively separating the same to provide not only electrostatic shielding but aperture lens-focusing for converging the electron beam strip through the slot means of the said outermost of the cylindrical means into said accelerating field.

4,100,451

FACE PANEL ASSEMBLY FOR A COLOR CATHODE RAY TUBE

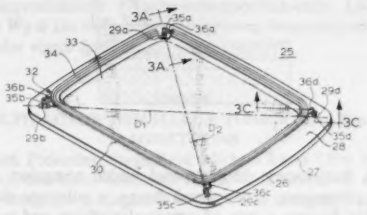
Kazimir Palac, Carpentersville, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Continuation of Ser. No. 498,836, Aug. 19, 1974, which is a continuation of Ser. No. 285,985, Sep. 5, 1972. This application Apr. 12, 1976, Ser. No. 675,653
Int. Cl.[2] H01J *29/07, 31/20*
U.S. Cl. 313—404 **23 Claims**

1. For use in a color cathode ray tube, the combination comprising: an approximately rectangular, flangeless, curved

faceplate supporting on a concave inner surface thereof in a central region a phosphor screen comprising a pattern of red-emissive, blue-emissive and green-emissive phosphor triads, said faceplate being subject, due to its flangeless rectangular construction to twist-wise deformations in configuration which may occur with respect to diagonals of the faceplate;

a low mass, approximately rectangular, non-self-rigid shadow mask having a central portion which has a curvature related to that of said faceplate inner surface and which contains a pattern of electron-transmissive apertures registered with said pattern of phosphor triads, said mask having a rim portion providing substantial rigidity with respect to axes normal to the sides thereof while providing for flexure of the mask with respect to its diagonals; and



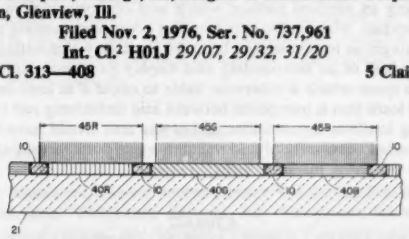
a mask suspension system for establishing an absolute position of said mask relative to and at a predetermined spacing from said inner surface of said faceplate while effectively imparting the rigidity of the faceplate to the non-self-rigid mask, comprising four suspension means for mechanically coupling said mask directly to corner portions of said concave inner surface of said faceplate which extend outwardly beyond the phosphor screen, said suspension means being located one at each corner of the mask to permit the mask to flex about said diagonals and conform to the contour of the faceplate despite any twist-wise deformation thereof and to thereby maintain said predetermined spacing between said mask and said faceplate inner surface.

4,100,452

COLOR TELEVISION PICTURE TUBE IMAGE SCREEN HAVING POSITIVE AND NEGATIVE MISREGISTRATION TOLERANCE CONDITIONS

Sam H. Kaplan, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 2, 1976, Ser. No. 737,961
Int. Cl.[2] H01J *29/07, 29/32, 31/20*
U.S. Cl. 313—408 **5 Claims**



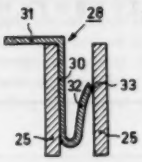
1. A color television picture tube having an evacuated envelope; an electron gun; a color selection electrode defining a pattern of electron beam passing apertures; and a multi-color image screen having a corresponding pattern of triads of red-light-emissive, blue-light-emissive, and green-light-emissive phosphor elements, the elements being spaced each from one another by a light-absorbing material, said tube being characterized by having within at least selected triads in said pattern of triads a first phosphor element and associated electron beam landing area with either a positive or negative misregistration tolerance condition and the remaining two phosphor elements and associated beam landing areas with an opposite tolerance condition to that obtaining for said first phosphor element.

4,100,453

ELECTRICAL CONNECTION OF ELECTRODES IN MULTIPLE GUN ELECTRODE STRUCTURE

Henricus Fransiscus Petrus van den Einden; Djuurd Anne Geertruid Kamerbeek, and Franciscus Jacobus Rimmelzwaan, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,855
Claims priority, application Netherlands, Sep. 24, 1976, 7610609
Int. Cl.[2] H01J *29/50, 29/02*
U.S. Cl. 313—417 **5 Claims**



1. A multiple electron gun system for a color display cathode ray tube comprising three electron guns extending substantially parallel to each other and to a longitudinal axis of said tube, each of said guns comprising at least one electrode located in the same region along said axis as the corresponding said electrode of each of the other of said guns, a plurality of rigid insulating support members, a pair of conductive braces connected, respectively, to two of said corresponding electrodes and rigidly engaging a first one of said insulating support members and extending alongside each other in a region between said two corresponding electrodes and said first one of said insulating support members, said multiple electron gun system comprising: a resilient conductive contact ribbon-shaped spring having substantially greater width than thickness, said spring being bent generally V-shaped to bring first and second surface portions thereof into juxtaposition with each other, said generally V-shaped spring being compressed between said pair of braces and extending substantially parallel to said axis, at least one portion of one leg of said ribbon-shaped spring making contact with a first one of said braces at points thereof spaced apart by a distance substantially equal to the width of said ribbon-shaped spring, and a portion of the second leg of said apring being bent slightly outwardly against the other brace of said pair of braces, said second leg having the free end engaging said other brace of said pair of braces and exerting resilient and frictional pressure thereagainst to hold said spring in engagement with said pair of braces.

4,100,454

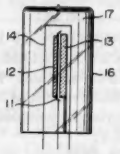
LOW-VELOCITY ELECTRON EXCITED FLUORESCENT DISPLAY DEVICE

Takashi Hase, Fujisawa; Akiyasu Kagami, Ninomiyamachi Kawawa; Yoshiyuki Mimura, Kamakura; Kinichiro Narita, and Minoru Hiraki, both of Chigasaki, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Jan. 20, 1976, Ser. No. 650,613
Claims priority, application Japan, Jun. 7, 1975, 50-68685
Int. Cl.[2] C09K *11/08;* **H01J** *63/04*
U.S. Cl. 313—495 **4 Claims**

1. A low-velocity electron excited fluorescent display device composed of a vacuum container or tube containing disposed therein at least an anodic plate having formed on one surface thereof a fluorescent screen and a cathode in line-form parallel-

ing said fluorescent screen, said fluorescent screen comprising a gallate-based phosphor represented by the formula



$$A(Zn_{1-x}Mg_x)O.Ga_2O_3:BMn$$

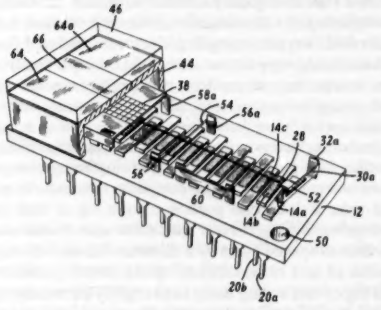
wherein $0.6 \leqq A \leqq 1.2$, $0 \leqq B \leqq 5 \times 10^{-2}$, and $0 \leqq x \leqq 0.5$.

4,100,455

VACUUM FLUORESCENT DISPLAY DEVICE WITH CIRCULAR POLARIZER

Richard DuBois, North Caldwell, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Oct. 14, 1976, Ser. No. 732,330
Int. Cl.² H01J *1/72, 63/06;* G02B *27/28*
U.S. Cl. 313—496 **6 Claims**



1. In a vacuum fluorescent display device having at least one electrically heated thermoelectron-emitting filament, at least one phosphor-coated anode, wherein said filament and anode are sealed in an enclosure having a hard vacuum therein, the improvement comprising:

(a) an electrostatic lens inside said enclosure interposed in the line of sight between the viewer and said filament.

(b) said electrostatic lens being a self-supporting substantially planar metallic sheet having a regular pattern of holes therethrough, said sheet and holes in combination forming a foraminous screen;

(c) said holes comprising from about 20 to about 50 percent of the screen area;

(d) a circular polarizer interposed in the line of sight between the viewer and said screen;

(e) a specularly reflecting surface on at least the side of said screen nearer said viewer; and

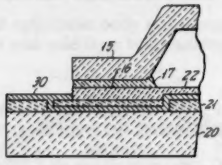
(f) said foraminous screen being connected to a positive voltage with respect to said filament.

4,100,456

LUMINESCENT DISPLAY PANEL COMPRISING A SEALING MASS FOR ELIMINATING SLOW LEAKS ALONG LEADS

Masaki Kobayakawa; Kazufumi Yawata, both of Izumi; Kazuo Ohta, and Koichi Kumazawa, both of Mine, all of Japan, assignors to Nippon Electric Kagoshima, Ltd., Izumi and Narumi China Corp., Nagoya, both of, Japan

Filed Feb. 1, 1977, Ser. No. 764,648
Claims priority, application Japan, Feb. 6, 1976, 51-12641; Feb. 6, 1976, 51-13427
Int. Cl.² H01J *5/24, 5/26, 5/32*
U.S. Cl. 313—497 **11 Claims**



1. A luminescent display panel which comprises a glass cover comprising a peripheral flange, a substrate-electrode assembly having a pair of principal surfaces and a frame-shaped area along one of said principal surfaces in conformity in shape with said peripheral flange, and a sealing layer substantially between said peripheral flange and said frame-shaped area for hermetically sealing said glass cover and said substrate-electrode assembly to enclose a vacuum space, said frame-shaped area including at least one strip-shaped area extending wholly transversely thereof and partly therealong, said one principal surface comprising a center area surrounded by said frame-shaped area and an edge area outwardly contiguous to said strip-shaped area, said substrate-electrode assembly comprising a single solid insulator substrate having a first and a second surface directed towards said vacuum space and providing the other of said principal surfaces, respectively, a plurality of luminescent anode segments in juxtaposition on said first surface with said center area, a hot cathode in said vacuum space over said anode segments, at least one grid between said cathode and said anode segments, an underlying and an overlying insulator layer successively on said first surface, and a plurality of electroconductive leads electrically connecting said anode segments, cathode, and grid out of said vacuum space and extended along said edge area, said insulator layers exposing said anode segments to said vacuum space and having an exposed surface which said one principal surface comprises, wherein the improvement comprises a sealing mass continguous to said sealing layer for positively eliminating the slow leak of air surrounding said display panel into said vacuum space which is otherwise liable to occur if at least one of said leads that is interposed between said underlying and overlying insulator layers under said center area would have been extended outwardly of said vacuum space continuously along said overlying insulator layer.

4,100,457

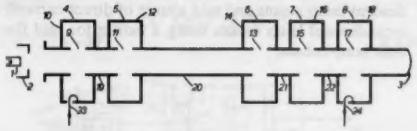
VELOCITY MODULATION TUBES EMPLOYING HARMONIC BUNCHING

Christopher John Edgcombe, Coton, England, assignor to English Electric Valve Company Limited, England

Filed Dec. 13, 1976, Ser. No. 749,989
Claims priority, application United Kingdom, Dec. 13, 1975, 51164/75
Int. Cl.² H01J *23/20*
U.S. Cl. 315—5.51 **3 Claims**

1. A velocity modulation tube having a drift space between at least one pre-buncher resonator system and at least one buncher resonator system, in which the length of said drift

space is dimensioned so that the reduced plasma drift angle between the interaction gap in the last pre-buncher resonator system and the interaction gap in the first buncher resonator system is greater than 90°, and wherein at least at said interaction gap in said last pre-buncher resonator system the ratio of



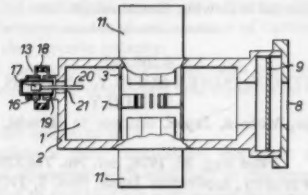
the peak value of the radio frequency voltage occurring at said interaction gap to the d.c. beam voltage lies in the range between approximately $2Wq/w$ and approximately $1.4Wq/w$ wherein Wq is the reduced angular plasma frequency and w is the angular signal frequency.

4,100,458

MULTIPACTOR DISCHARGE TUNED CO-AXIAL MAGNETRONS

Alan Hugh Pickering, Springfield; Michael Barry Clive Brady, Maldon, and Peter Frederick Lewis, Chelmsford, all of England, assignors to English Electric Valve Company Limited, England

Filed Dec. 15, 1976, Ser. No. 750,855
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.55 **21 Claims**



1. A co-axial magnetron including an anode structure having a plaurlity of cavities, and a main resonant cavity co-axially surrounding said anode structure, said anode structure including coupling means for coupling the cavities thereof with said main resonant cavity and at least one resonator separate from said main cavity and incorporating a multipactor discharge arrangement for modifying the resonant characteristics of the separate resonator and means for coupling said resonator or resonators symmetrically into the main co-axial resonant cavity of said magnetron.

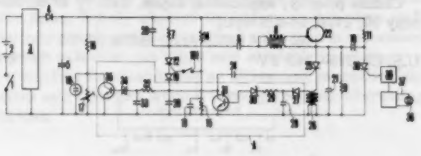
4,100,459

INDICATOR CIRCUIT FOR ELECTRONIC FLASH APPARATUS

Zenzo Nakamura, Urawa; Syohei Ohtaki, Yokohama; Tokuichi Tsunekawa, Yokohama; Tadashi Ito, Yokohama; Hiroshi Aizawa, Kawasaki, and Takashi Uchiyama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1976, Ser. No. 671,736
Claims priority, application Japan, Apr. 8, 1975, 50-42570
Int. Cl.² G08B *5/38;* H05B *41/26*
U.S. Cl. 315—136 **13 Claims**

1. An electronic flash apparatus comprising:
(a) a flash means for producing a flash light;
(b) an energy supply circit connected to said flash means for applying to said flash means electric energy which is converted to light energy in said flash means;
(c) a detecting circuit for detecting an output voltage of the energy supply circuit and producing an output signal when the output voltage of said energy supply circuit has reached a predetermined voltage level;
(d) display means having first and second states, which assumes the first state in response to the output signal from said detecting circuit;



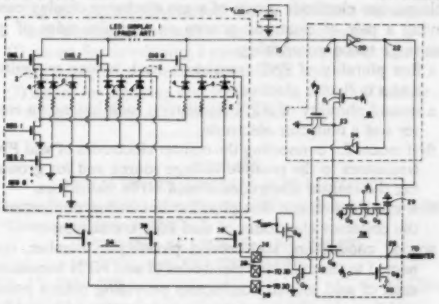
(e) signal producing means connected in the discharge path of said energy supply circuit upon response to the ionization of said flash means to produce an electrical signal; and
(f) control means connected to said display means and responsive to the electrical signal from said signal producing means for controlling the output stage of said display means.

4,100,460

ONE CHIP DIRECT DRIVE AND KEYBOARD SENSING ARRANGEMENT FOR LIGHT EMITTING DIODE AND DIGITRON DISPLAYS

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 2, 1976, Ser. No. 654,678
Int. Cl.² H05B *37/00*
U.S. Cl. 315—162 **10 Claims**

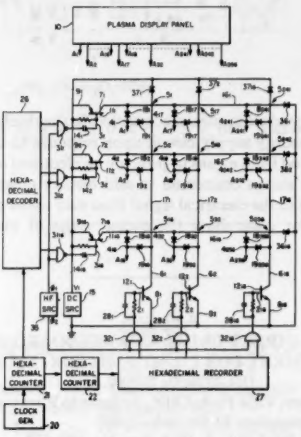


1. In combination,
source means for supplying a plurality of reference potentials,
said source means to be connected to supply a first of said plurality of reference potentials to a first display means during a first mode of operation,
said source means to be connected to supply a second of said plurality of reference potentials to a second display means during a second mode of operation,
logic circuit means having input and output terminal means, said logic circuit means selectively connected to one of said first and second display means,
said logic circuit means including a signal level shifting means selectively connected between said input and output terminal means for activation during said first mode of operation, and
said logic circuit means further including a first inverter means having a first input terminal connected to said logic circuit means input terminal means and an output terminal connected to said logic circuit means output terminal means for activation during said second mode of operation.

4,100,461
DRIVING CIRCUIT FOR A GAS DISCHARGE DISPLAY PANEL

Hiroshi Hada, and Tsutomu Hirayama, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1976, Ser. No. 703,058
Claims priority, application Japan, Jul. 7, 1975, 50-83269; May 18, 1976, 51-62970[U]
Int. Cl.[2] H01J *1/53;* H05B *37/00*
U.S. Cl. 315—169 TV **4 Claims**



1. A circuit for driving, by the use of a source of a positive voltage, one electrode group of a gas discharge display panel having a pair of electrode groups on opposite sides of gas discharge space, comprising:

a first plurality of PNP transistors, each having an emitter and a collector electrode;

a second plurality of NPN transistors, each having an emitter and a collector electrode;

first means for connecting the emitter electrodes of said PNP transistors to the positive voltage source and for grounding the emitter electrodes of said NPN transistors;

first conductors, said first plurality in number, connected to the collector electrodes of said PNP transistors;

second conductors, said second plurality in number, connected to the collector electrodes of said NPN transistors, each of said second conductors providing matrix points, said first plurality in number, in cooperation with said first conductors;

forwardly directed diode means each having a predetermined intermediate junction point and connected between said first and second conductors at each of the said matrix points;

second means for connecting the predetermined points to the respective electrodes of said one electrode group;

first diodes, said first plurality in number, connected to said first conductors for clamping the potential of said first conductors to a predetermined potential; and

second diodes, said second plurality in number, connected to said second conductors for clamping the potential of said second conductors to a predetermined potential.

4,100,462
COMBINATION INCANDESCENT/FLUORESCENT LIGHTING SYSTEM

Norvel Jeff McLellan, 1002 N. Main, Pleasanton, Tex. 78064

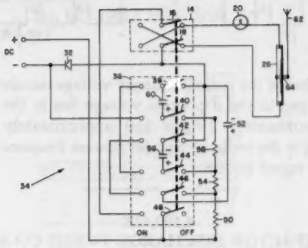
Filed May 11, 1977, Ser. No. 795,779
Int. Cl.[2] H05B *35/00, 41/18*
U.S. Cl. 315—179 **12 Claims**

1. A combination incandescent/fluorescent lighting system for providing an efficient, high quality light, said lighting system comprising:

a source of direct current;

incandescent lamp means connected to said source of direct current;

fluorescent lamp means connected in series with said incandescent lamp means and said source of direct current, said incandescent lamp means being a ballast for said fluorescent lamp means;



bypass means in series with said fluorescent lamp means;

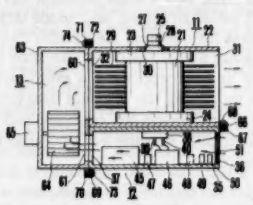
auxiliary circuit means in parallel with said bypass means to start current flow through said fluorescent lamp means, said bypass means thereafter maintaining current flow through said incandescent lamp means and fluorescent lamp means;

reversing means for changing the direction of current flow through said fluorescent lamp means during periods when no current is flowing therethrough.

4,100,463
MAGNETRON, POWER SUPPLY, AND FAN INTEGRAL ASSEMBLY

Jiro Sugie, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 30, 1976, Ser. No. 718,829
Claims priority, application Japan, Nov. 5, 1975, 50-132145; Nov. 7, 1975, 50-133083
Int. Cl.[2] H05B *37/00*
U.S. Cl. 315—205 **15 Claims**



1. Magnetron apparatus comprising a magnetron oscillator unit for generating microwave power, a source unit containing a power source unit for operating said magnetron oscillator unit, a fan unit for circulating cooling air through said magnetron oscillator unit and said source unit, said magnetron unit, power source unit, and fan unit each being contained in a different metal casing, each casing having walls and at least two openings in its walls to provide an air passage through each casing, and means for connecting together the casings into an integral assembly, one air passage opening of a casing being coincident with one air passage opening of a different casing to which it is connected by said connecting means to form an air passage through said connected magnetron, power source, and fan casings having an air inlet opening provided by an opening in a wall of one casing and an air outlet opening provided by an opening in a wall of different casing.

4,100,464

ELECTRIC AMPLIFYING ARRANGEMENTS

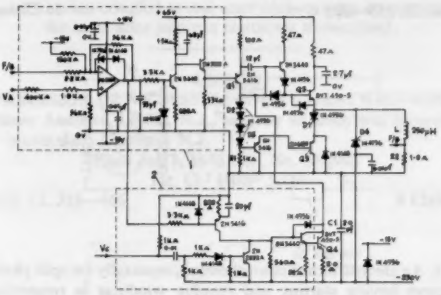
Charles William Ovenden, Strood, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Aug. 16, 1976, Ser. No. 714,319

Claims priority, application United Kingdom, Aug. 29, 1975, 35724/75

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—397 8 Claims



1. An electric amplifying arrangement for supplying current to an inductive load in response to an input signal of saw-tooth waveform comprising:

(A) a first controllable electronic switching device connected between said load and a source of current for said load of one polarity;

(B) a second controllable electronic switching device connected between said load and a source of current for said load of the opposite polarity;

(C) a first discharge path connected with said load to discharge energy supplied to said load via said first switching device;

(D) a second discharge path

(i) including a third controllable electronic switching device connected with said load to discharge energy supplied to said load via said second switching device; and

(E) control means responsive to said input signal to close said third and first switching devices during consecutive first and second parts of the ramp portion of the input signal respectively, and to close said second switching device during the latter part of the flyback portion of the input signal;

(F) said control means so controlling the discharge of energy from the load through the third switching device, and the supply of current to the load through the first switching device, that a linear relation is maintained between the variation in the load current and the input signal during the said first and second parts of the ramp portion of the input signal.

4,100,465

TURNTABLE SPEED CONTROL SYSTEM

Shunji Hagino, Shikoda Kashiwa, Japan, assignor to RCA Corporation, New York, N.Y.

Filed Jul. 20, 1977, Ser. No. 817,343

Claims priority, application United Kingdom, Aug. 9, 1976, 33121/76; Jul. 1, 1977, 33121/76

Int. Cl.[2] A02P *5/46*

U.S. Cl. 318—41 3 Claims

1. A speed control apparatus comprising:

(A) a mounting plate;

(B) a turntable secured for rotation on said mounting plate;

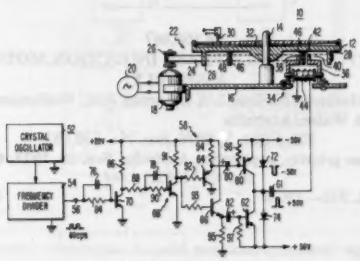
(C) a ring concentrically secured to said turntable for rotation therewith; said ring having a plurality of permanently magnetized poles of alternate polarity symmetrically disposed along its periphery;

(D) rotating means;

(E) variable coupling means for transferring motion of said rotating means to said turntable;

(F) a magnetizable core including a pair of pole pieces having spaced surfaces defining an air gap; said magnetizable core being fixedly secured to said mounting plate such that said permanently magnetized poles pass in succession through said core gap when said turntable is rotating;

(G) a winding for establishing an alternating magnetic field across said core gap when it is energized with alternating current;



wherein said magnetized ring and said energized core form a synchronizer for opposing any departures of the turntable speed from a predetermined speed corresponding to the frequency of the winding energization current divided by half the number of said poles;

(H) a capacitor in a circuit relationship with said core winding for establishing a load which exhibits a resonance at said winding energization current frequency;

(I) means for developing a square wave output at said winding energization current frequency; and

(J) means for applying said square wave output of said developing means to said resonant load.

4,100,466

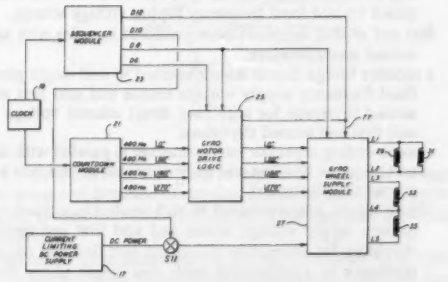
COLD START SYSTEM FOR MOTORS

George Francis Schroeder, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Dec. 10, 1976, Ser. No. 749,651

Int. Cl.[2] G01F *1/82*

U.S. Cl. 318—102 7 Claims



1. A method for rapidly cold starting gyro motors in a gyro platform having at least a vertical gyro motor and an azimuth gyro motor both of which are multiphase motors normally operating at a first frequency said motors being supplied from a supply module comprising a plurality of switches for converting a DC voltage into a square wave AC voltage, said switches being supplied with appropriate switching wave-

forms at the normal operating frequency of the motors, comprising:

(a) dividing the normal frequency waveforms used to control the switching means to a lower frequency;

(b) energizing a first phase winding of both of said motors with said lower frequency;

(c) energizing the other phase windings of one of said motors with said lower frequency for a first predetermined amount of time;

(d) de-energizing said other windings of said first motor and energizing the other winding of said second motor, at said lower frequency;

(e) after a second predetermined period of time, energizing all windings of both motors with normal frequency.

4,100,467

TYPE OF SINGLE PHASE INDUCTION MOTOR ASSEMBLY

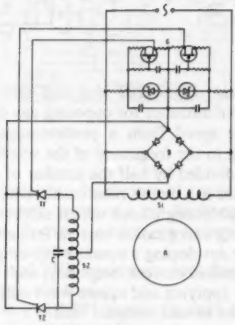
Willis Herbert Charlton, 2/A Byrarong Ave., Wollongong, New South Wales, Australia

Filed Oct. 7, 1976, Ser. No. 730,652

Claims priority, application Australia, Sep. 20, 1973, 4921/73

Int. Cl.[2] H02P *1/44*

U.S. Cl. 318—220 R **1 Claim**



1. A single phase induction motor assembly having a rotor and a stator comprising:

first and second stator windings spaced ninety electrical degrees on the stator core with respect to one another and coupled to the rotor;

a single phase fixed frequency supply voltage source interconnected to said first stator winding, such that the frequency of the voltages and currents in said first and second stator windings and the speed of the motor are determined by said fixed frequency supply voltage source;

first and second thyristors interconnected in series with said second stator winding;

a rectifier bridge circuit interconnected to said single phase fixed frequency supply voltage source and said first and second thyristors for supplying direct current voltage to said first and second thyristors;

a commutating capacitor interconnected in parallel with said second stator winding and interconnected to said first and second thyristors; and

circuit means interconnected to said single phase fixed frequency supply voltage source and said first and second thyristors for alternately energizing said first and second thyristors in synchronism with said single phase fixed frequency supply voltage source, such that said first and second thyristors apply a periodic voltage to said second stator winding, said periodic voltage having a fundamental frequency shifted in time phase with respect to said single phase fixed frequency supply voltage source to induce currents in said windings, such that said winding currents interact with the rotor to produce a motoring torque at all speeds from standstill to near synchronous speed determined externally by said single phase fixed frequency supply voltage source.

4,100,468

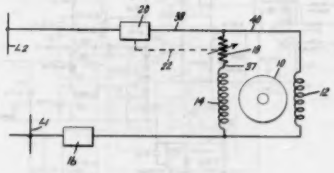
ELECTRIC MOTOR CONTROL AND METHOD

Charles W. Slocum, Spring Lake Heights, N.J., assignor to Sealed Unit Parts Co., Inc., Allenwood, N.J.

Filed Apr. 4, 1977, Ser. No. 784,285

Int. Cl.[2] H02P *1/44*

U.S. Cl. 318—221 C **16 Claims**



1. An electric motor control circuit, especially for split phase motors having starting and running windings in respective parallel branches, said circuit comprising; a positive temperature coefficient resistor element in the starting winding branch, a switch having normally closed separable contacts in series with both branches, motor load sensitive means in circuit with at least said running winding and operable at a predetermined motor load to move said contacts to open position, and control means operable when said resistor element is above a predetermined temperature to prevent said switch contacts from closing after having been actuated into open position thereof.

4,100,469

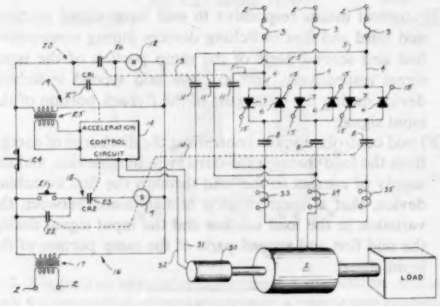
HYBRID MOTOR STARTER

Terrance D. Nelson, and Bruce G. Klippel, both of Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 25, 1977, Ser. No. 790,571

Int. Cl.[2] H02D *5/40*

U.S. Cl. 318—227 **6 Claims**



1. A motor starter for coupling current from a power line to a motor, the combination comprising:

a first conductive branch connected between the power line and the motor, said first conductive branch including a solid state device suitable for controlling current in said first branch and a set of series connected contacts associated with a start contactor;

a second conductive branch connected between the power line and the motor in shunt with said first conductive branch, said second conductive branch including a set of contacts associated with a run contactor; and

a control circuit which includes:

(a) a start switch;

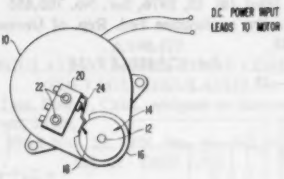
(b) means coupled to said start switch for energizing said start contactor when said start switch is operated;
(c) means coupled to said solid state device for driving it from its nonconductive state to its conductive state after said start contactor is energized;
(d) speed feedback means coupled to said motor for sensing motor speed;
(e) means coupled to said speed feedback means for energizing said run contactor when said motor reaches a preselected speed; and
(f) means coupled to said start contactor for deenergizing the same after said run contactor is energized.

4,100,470

PRECISION DRIVE SYSTEM FOR A CHART RECORDER

Elmer Andrews, Leonia, N.J., assignor to Analytical Measurements, Inc., Chatham, N.J.

Filed Jul. 1, 1976, Ser. No. 701,995
Int. Cl.[2] H02P *3/00*
U.S. Cl. 318—466 **8 Claims**



1. A precision chart drive system for a chart recorder comprising:
a power source;
a drive motor for driving said chart recorder and having a rotatable output shaft and adapted for electrical connection to said power source;
a pulse generator operative in response to said power source to provide a pulse at regular time intervals including;
an oscillator;
means responsive to said oscillator for providing a pulse at regular time intervals;
means for differentiating said pulse to provide a spike pulse;
means for amplifying said spike pulse to provide a trigger pulse;
means associated with said pulse generator for selectably varying said pulse rate to provide a selectably variable chart recorder drive speed;
a motor starting means operative in response to said trigger pulse for starting said motor at said regular time intervals;
switching means operative in response to said initial motor motion for connecting said motor directly to said power source; and,
self interrupting means for said motor to turn said motor off after a predetermined angular rotation of said shaft.

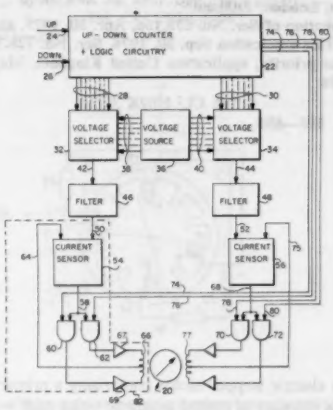
4,100,471

STEPPING MOTOR CONTROL CIRCUIT

Eric K. Pritchard, 1702 Plymouth Ct., Bowie, Md. 20716

Continuation of Ser. No. 501,891, Aug. 30, 1974, abandoned. This application Jul. 20, 1976, Ser. No. 707,129
Int. Cl.[2] G05B *19/40*
U.S. Cl. 318—685 **13 Claims**

1. A control circuit for a stepping motor having a non-linear transfer function of current to flux, comprising:
(a) means for receiving an input signal indicative of the desired direction and rate of motor travel,
(b) means responsive to said input signal for developing a position command signal which is a sinusoidal wave form modified by the inverse of said transfer function, including means for simultaneously developing a plurality of discrete direct voltage signals and means responsive to said input signal for selecting a particular one of said discrete direct voltage signals and developing a command signal therefrom, and



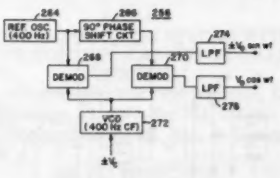
(c) means responsive to said position command signal for developing an energization signal for said stepping motor.

4,100,472

SATELLITE TRACKING ANTENNA SYSTEM

Joseph Graham Mobley, De Kalb, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Division of Ser. No. 598,492, Jul. 23, 1975, Pat. No. 4,035,805. This application Aug. 19, 1976, Ser. No. 715,731
Int. Cl.[2] G05B *19/40*
U.S. Cl. 318—685 **10 Claims**



1. Apparatus for controlling in response to a control voltage the speed and direction of rotation of a two phase D.C. stepper motor having first and second field windings, said apparatus comprising
means for generating first and second sinusoidal drive voltages which are in quadrature phase relationship, said first voltage being applied to said first winding and said second voltage being applied to said second winding, and
means responsive to said control voltage for varying the frequency of both said first and second drive voltages and reversing the polarity of said first drive voltage, respectively, for varying the speed and direction of rotation of said motor.

4,100,473

ELECTRIC STEPPER MOTORS

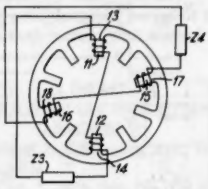
Peter John Lawrenson, and Austin Hughes, both of Leeds, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 573,156, Apr. 30, 1975, abandoned. This application Sep. 30, 1976, Ser. No. 728,732

Claims priority, application United Kingdom, May 1, 1974, 19132/74

Int. Cl.² H02K 37/00

U.S. Cl. 318—696 7 Claims



1. An electric stepper motor comprising a primary member having a plurality of spaced magnetic poles each wound with a drive coil, said magnetic poles being arranged to be energised in sequence, and a secondary member having at least two magnetic poles, the primary and secondary members being arranged for relative movement caused by switching of the energisation of the drive coils, said motor further comprising at least one coil additional to the drive coils and wound on the primary member, said additional coil being independent of a connection to an external source of voltage which would cause continuous energisation thereof and being connected with an impedance having a resistance component in a closed circuit to dampen oscillation between the primary and secondary members.

4,100,474

MULTI-VOLTAGE VEHICULAR NETWORK SYSTEM

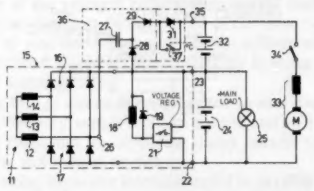
Peter Pfeffer, Lauffen, and Istvan Ragaly, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,438

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603783

Int. Cl.² H02J 7/14

U.S. Cl. 320—17 10 Claims



1. Multi-voltage vehicular network system having

an alternator (11) having armature windings (12, 13, 14) and a field (18);

a rectifier system (15) connected to the armature windings, supplied from the alternator at a first voltage level and providing a d-c output at d-c output terminals (22, 23);

a voltage regulator (21) connected to the alternator, responsive to the alternator voltage at said first voltage level and controlling the output voltage thereof;

a voltage doubling circuit (36) including a capacitor (27) and two series connected diodes (28, 29) and providing output voltage at a second and higher level than said first level at a double voltage output terminal (35), connected to the free terminal of one (29) of said diodes (28, 29),

wherein, the capacitor (27) of the voltage doubling circuit is connected to the junction between the series connected diodes and to an armature winding (12) of the alternator, and the other diode (28) has its free terminal connected to one (23) of the d-c output terminals (22, 23) and forming the output of the rectifier system (15) at said first voltage level to provide a doubled output voltage at said double voltage terminal (35) derived from the alternator supplying the rectifier at said first voltage level and which is regulated in accordance with the control by said voltage regulator (21).

4,100,475

BATTERY TEMPERATURE COMPENSATED BATTERY-CHARGING SYSTEM

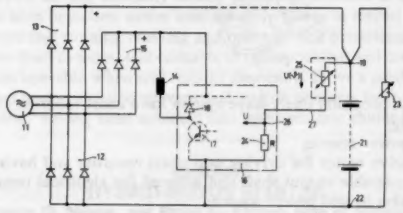
Willi Gansert, Kornwestheim, and Harry Slansky, Mühlacker, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 15, 1976, Ser. No. 705,455

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535245

Int. Cl.² H02J 7/14

U.S. Cl. 320—35 10 Claims



1. Vehicular battery charging equipment comprising, in combination with a battery.

an electric generator having an excitation winding, and

a temperature-sensitive voltage regulator connected to said excitation winding and to said battery and containing, in circuit as components thereof, active semiconductor switching devices and passive circuit components of which at least one has a temperature-sensitive function, said passive circuit components including diodes and resistors, said voltage regulator having a component having a temperature-sensitive function located apart and relatively remote from the remainder of said voltage regulator, said remote component having a temperature-sensitive function constituting a two-terminal circuit portion directly connected with the ungrounded terminal (19) of the battery (21), and in the connection (27) electrically connecting said terminal of the battery (21) with the remainder of the voltage regulator.

4,100,476

SINGLE SECONDARY DIMMING INVERTER/BALLAST FOR GAS DISCHARGE LAMPS

Horace Ghiringhelli, Dumont, N.J., assignor to Isodyne, Inc., Nanuet, N.Y.

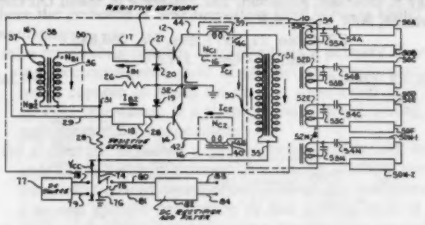
Continuation of Ser. No. 572,941, Apr. 29, 1975, Pat. No. 4,016,477. This application Feb. 16, 1977, Ser. No. 769,159

Int. Cl.² H02M 7/00

U.S. Cl. 315—297 7 Claims

1. A dimming inverter ballast for operating and dimming multiple electric gas discharge lamps, which comprises a current feedback inverter and a high leakage transformer, said inverter and said high leakage transformer having a primary

coil and a single secondary coil tuned to a high frequency for optimum power transfer and maximum light output from the



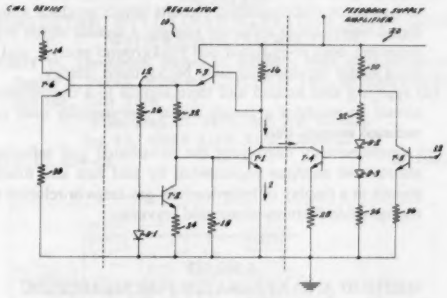
lamp loads, and wherein a single magnetic path links both the primary coil and the secondary coil.

4,100,477

FULLY REGULATED TEMPERATURE COMPENSATED VOLTAGE REGULATOR

Richard K. Tam, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 29, 1976, Ser. No. 745,660
Int. Cl.² G05F *5/00*
U.S. Cl. 323—19 **9 Claims**



1. A voltage regulator comprising:

means providing a reference voltage and a positive supply voltage,

circuit means including first and second NPN transistor means connected between said positive supply and said reference voltage and with the base of the first transistor being connected to the collector of the second transistor means so as to be insensitive to changes in temperature,

a feedback supply amplifier circuit means between said positive supply voltage and said reference voltage and connected to said first transistor means whereby the current through said first transistor means is maintained constant, over variation in positive supply voltage, said feedback supply amplifier including third NPN transistor means and circuit means, the collector of said third transistor means being connected to the collector of said first transistor means,

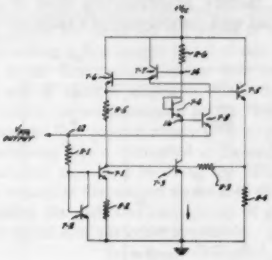
said feedback supply amplifier further including a first, second and third resistance means and a pair of diode means connected in series between said positive supply voltage and said reference voltage with said base of said third transistor means being connected between said pairs of diode means.

4,100,478

MONOLITHIC REGULATOR FOR CML DEVICES

Richard K. Tam, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 28, 1977, Ser. No. 772,767
Int. Cl.² G05F *3/08*
U.S. Cl. 323—19 **5 Claims**



1. In a voltage regulator a temperature compensating circuit so as to be insensitive to changes in temperature and connected to means providing a reference voltage and a positive supply voltage;

the improvement comprising,

means including a first NPN transistor connected between said positive supply and said reference voltage;

an output node;

a supply voltage variation compensation circuit means between said positive supply voltage and said output node so that said output node is constant over variations of positive supply voltage;

said compensation circuit including matched pairs of transistors, one of said transistors of the first of said matched pair being said first NPN transistor with the second of the same matched pair having an emitter electrode connected to the collector electrode of said first transistor to establish a current path between said positive supply and said first NPN transistor, the bases of the second matched pair are also connected to the same current path while the emitter electrode of the transistor of said second matched pair is connected to the collector electrode of the other transistor of the second matched pair and the emitter electrode of the latter is connected to said output node.

4,100,479

ELECTRONIC MONITORING SYSTEM WITH ZENER DIODE TO CONTROL CAPACITOR CHARGING CURRENT

Robert Buck, Kirchbühlweg 128, 7995 Neukirch, Germany

Filed Apr. 12, 1977, Ser. No. 786,805
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616265
Int. Cl.² H01H *36/00*
U.S. Cl. 323—19 **10 Claims**

1. An electronic monitoring system comprising:

detector means sensitive to an ambient condition for generating an output signal varying with a change in said condition, said detector means being provided with a pair of power-input terminals;

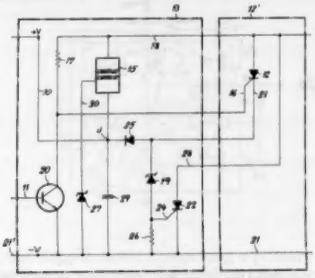
a voltage-generating network including a storage capacitor and a constant-current unit in series therewith, said terminals being connected across said storage capacitor in an energizing circuit for said detector means;

a source of direct current with a pair of output leads connected across said network for charging said storage capacitor via said constant-current unit, one of said output leads having an extension included in said energizing circuit;

a current-responsive load in series with said source and said constant-current unit;

voltage-controlled variable-impedance means connected in shunt with at least part of said network across said source in series with said load;

electronic control means coupled to said detector means and connected to said variable-impedance means for altering the conductivity thereof in response to changes in said output signal, thereby modifying the flow of current through said load with maintenance of a sufficient voltage



drop across said storage capacity to keep said detector means operative; and

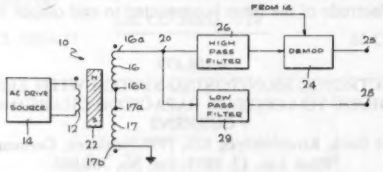
an electronic breakdown device connected between said one of said output leads and a control input of said constant-current unit for throttling the flow of charging current into said storage capacitor while drawing a reduced sustaining current from a section of said constant-current unit, lying between said control input and the other of said output leads, upon said storage capacitor reaching a predetermined charging voltage.

4,100,480

POSITION AND VELOCITY SENSORS

Dan R. Lytle, Canoga Park, and Ronald C. Burski, Simi Valley, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Aug. 20, 1976, Ser. No. 716,162
Int. Cl.[2] G05F *7/00*
U.S. Cl. 323—51 **31 Claims**



1. In a position sensor including a primary winding to which an AC signal is appliable, first and second secondary windings, a moveable core coupling said primary winding to said secondary windings, and connecting means for connecting said secondary windings so that AC signals induced therein as a function of the AC signal in said primary winding are 180° out of phase with respect to one another, the sensor providing an output signal whose amplitude is a function of the core position with respect to said secondary windings, the improvement comprising:

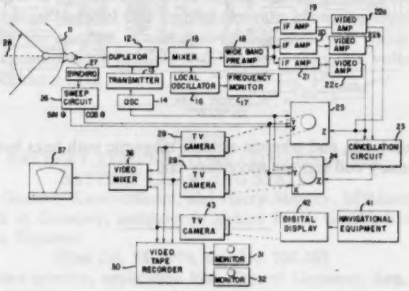
controllable means included in said connecting means for controlling the connections between the secondary windings to cause said sensor to provide an output signal of a same selected amplitude when said core is at any one of *n* different positions with respect to said secondary windings, where *n* is an integer not less than 2.

4,100,481

HYDROCARBON EXPLORATION WITH DISPLAY OF RE-RADIATED AND REFLECTED MICROWAVE ENERGY

Luke S. Gournay, Rockwall, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 760,885
Int. Cl.[2] G01V *3/12, 3/16*
U.S. Cl. 324—4 **9 Claims**



1. The method of exploring for hydrocarbon gas seeps comprising:

(a) transporting an antenna along a traverse above the surface of the earth,

(b) radiating from said antenna microwave energy having a transmitter frequency which excites the gas to emit microwave energy at a re-radiated frequency characteristic of a molecular resonance of the particular species of gas,

(c) applying the microwave energy received by said antenna to frequency discriminating circuits which produce a first signal representing reflected energy, a second signal representing both re-radiated and background energy, and a third signal representing only background energy,

(d) applying said second and third signals to a cancellation circuit to produce a fourth signal representing only re-radiated energy, and

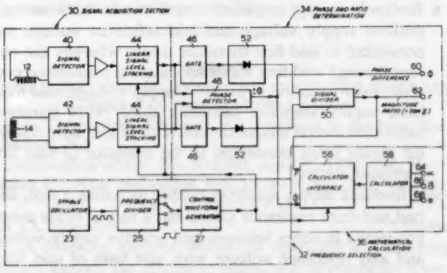
(e) simultaneously displaying the re-radiated and reflected microwave energies represented by said first and fourth signals as a display of hydrocarbon gas seeps in relation to topographic features along said traverse.

4,100,482

METHOD AND APPARATUS FOR MEASURING ELLIPSE PARAMETERS OF ELECTROMAGNETIC POLARIZATION IN GEOPHYSICAL EXPLORATION

Mitsura Yamashita, Willowdale; Kousaku Hirano, and Nguyen Dang Thai, both of Don Mills, all of Canada, assignors to Mits-Co Geophysics Ltd., Willowdale, Canada

Filed Jun. 29, 1976, Ser. No. 700,775
Int. Cl.[2] G01V *3/10*
U.S. Cl. 324—6 **15 Claims**



11. Apparatus for detection of geophysical anomalies which

manifest themselves by production of a secondary alternating electromagnetic field in the presence of a primary alternating electromagnetic field, where the resultant field is elliptically polarized and the ellipse of polarization is tilted at any location where the presence of said secondary field is being tested for, comprising:

(a) a transmitter capable of transmitting a primary alternating electromagnetic field at at least one frequency, and being capable of being set up and maintained in a first specific orientation at a transmission location during any such transmission procedure;

(b) a receiver including a pair of crossed coils, and being capable of being positioned at a testing location remote from said transmitter and of being set up and maintained in a second specific orientation of said crossed coils at any such testing location during any transmission procedure from said transmitter;

(c) first and second signal detecting means for detecting the presence of a signal on the one of the other of said crossed coils of said receiver, respectively;

(d) phase detector means for detecting and producing a signal which is a functon of the phase difference quantity ϕ between the signals detected on said crossed coils of said receiver;

(e) signal divider means for producing a signal which is a function of the magnitude ratio quantity r of the signals detected on said crossed coils of said receiver; and

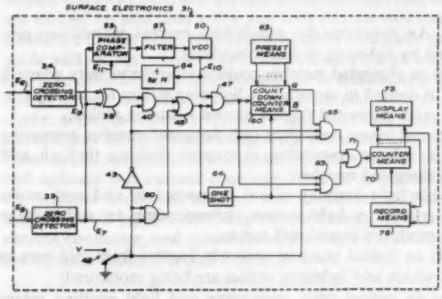
(f) calculating means for mathematically analyzing and processing said phase differece quantity ϕ and said magnitude ratio quantity r to obtain such ellipse parameters of polarization of said resultant electromagnetic field as the tilt angle, ellipticity angle and ellipticity ratio thereof.

4,100,483

DIELECTRIC WELL LOGGING SYSTEM AND METHOD WITH ERROR CORRECTION

Larry W. Thompson; James R. Bridges, both of Houston, and James A. Fuchs, Missouri City, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,406
Int. Cl.[2] G01V *3/18, 3/10;* G01R *25/00*
U.S. Cl. 324—6 **20 Claims**



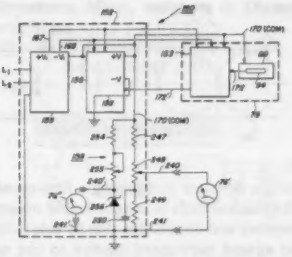
1. A dielectric well logging system comprising a logging tool adapted to be passed through a borehole traversing an earth formation, said logging tool includes means for inducing electrical energy into the earth formation at a radio frequency, and at least two receiver means spaced a predetermined distance apart for providing intermediate frequency signals corresponding to electrical energy received from the formation; cable means connected to the receiver means for transmitting the intermediate frequency signals; and surface electronics including zero crossing detector means connected to the cable means, each detector means receiving a different intermediate frequency signal from the cable means for providing a detector signal whose change in amplitude is representative of the intermediate frequency signal passing through zero, clock pulse means for providing clock pulses at a frequency substantially greater than the frequency of the intermediate frequency signals, gating means connected to the detector means and to the clock pulse means for providing groups of clock pulses in accordance with the detector signals, the number of clock pulses in each group corresponding to the dielectric constant of the earth formation and to a known error, error means connected to the gating means for removing a number of pulses from each group of pulses corresponding to the known error, said error means includes first counter means connected to the gating means for counting the pulses in the groups of pulses and providing a first output signal of one amplitude when the count in the first counter means does not exceed the error count and of another amplitude when the count exceeds an error count, means connected to the first counter means for resetting the first counter means prior to each group of pulses, and switching means connected to the gating means and to the first counter means for blocking the pulses in each group of pulses when the first output signal is of the one amplitude and for passing the pulses in each group of pulses when the first output signal is of the other amplitude.

4,100,484

D.C. ELECTROMETER

Robert F. Buchheit, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1976, Ser. No. 744,913
Int. Cl.[2] G01R *5/28*
U.S. Cl. 324—32 **3 Claims**



1. In a d.c. type electrostatic voltmeter for measuring charge voltages on a xerographic plate including a probe adapted for disposition in spaced relation to said plate, the combination of:

signal processing means for processing the signal output from said probe, said signal processing means having at least two inputs;

first control means having an input side and an output side, said first control means output side being coupled to a first input of said signal processing means to provide a reference signal to said signal processing means;

second control means having an input side and an output side, said probe being coupled to said second control means input side, said second control means output side being coupled to a second input of said signal processing means whereby to apply the signal output of said probe to said signal processing means;

a voltage source;

said signal processing means including circuit means coupling said voltage source to the input side of said first control means, said signal processing means controlling said voltage source in response to said reference signal and the signal output of said probe to provide a voltage output to said first control means tending to balance the reference signal from said first control means to said processing means with the signal output of said probe; and

means to calibrate said probe and maintain said balance between said first and second control means while said probe is not in use including

first switch means effective when actuated to couple said

probe and the input side of said second control means to said voltage source;

said circuit means including charge retaining means; and

second switch means effective when actuated to couple said signal processing means with said charge retaining means and the input side of said first control means to produce a balancing potential on said charge retaining means whereby on use of said probe, said charge retaining means provides a voltage output tending to balance the reference signal from said first control means to said processing means with the signal output of said probe.

4,100,485

PHASE DISPLACED MEASUREMENT OF CONTIGUOUS SPHERICAL BALLS

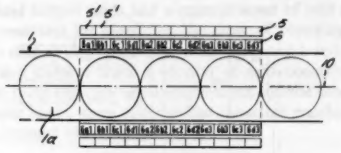
Michael James Rogers, Peterborough, England, assignor to The Newall Engineering Company Ltd., England

Filed Jul. 27, 1976, Ser. No. 709,086

Claims priority, application United Kingdom, Feb. 17, 1976, 6258/76

Int. Cl.[2] G01R *33/00*

U.S. Cl. 324—208 **8 Claims**



1. A position detector comprising a first member, a row of contiguous spherical balls of magnetizable material carried by said first member and disposed in side by side point contact and constrained against movement relative to one another, a second member, a transducer carried by said second member, said first and second members being relatively movable in a direction parallel to the row of balls and to the line of contact thereof, and said transducer comprising means for producing a periodically varying magnetic field through the balls in a direction extending along the line of point contact and means for sensing phase-displaced variations produced in the magnetic field by said relative movement and for producing signals denoting the relative positions of the first and second members, said sensing means comprising at least two pick-up coils which are spaced apart along the row of balls and the line of point contact thereof and through which the balls pass.

4,100,486

MONITOR FOR SEMICONDUCTOR DIFFUSION OPERATIONS

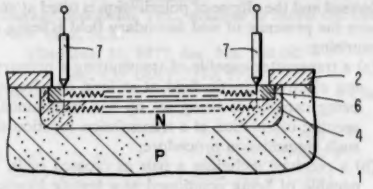
Barry N. Casowitz, Poughkeepsie; Michael D. Cowan, Wappingers Falls, both of N.Y.; Charles B. Humphreys, Essex Junction, Vt., and Akella V. S. Satya, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,691

Int. Cl.[2] G01R *27/02*

U.S. Cl. 324—62 **18 Claims**

1. A method of testing continuity defects in a diffused region in a silicon semiconductor substrate comprising forming adjacent a surface portion of said region a silicide of transition



metal, and measuring the resistance of said silicide at spaced points thereon.

4,100,487

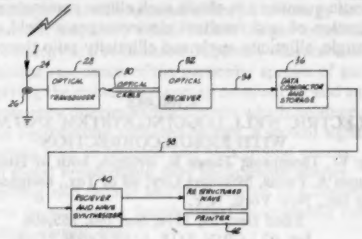
LIGHTNING CURRENT WAVEFORM MEASURING SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Ronald J. Wojtasinski, Cocoa Beach; Jerry C. Fuchs, Cocoa, both of Fla., and Charles H. Grove, Huntsville, Ala.

Filed Mar. 30, 1977, Ser. No. 782,693

Int. Cl.[2] G01R *31/00*

U.S. Cl. 324—96 **6 Claims**



1. An apparatus for monitoring current waveforms produced by lightning strikes comprising:

(a) an elongated member positioned in the vicinity where it is desired to monitor the lightning strikes for having currents generated therein by said lightning strikes;

(b) coil means encircling said elongated member generating a voltage responsive to current flowing through said elongated member;

(c) a light emitting means connected to said coil means generating light waves corresponding to said voltage produced in said coil means;

(d) an optical receiver remotely located from said area in which said lightning strikes are being monitored;

(e) an optical cable connecting said light emitting means with said optical receiver for transmitting said light waves therebetween;

(f) an analog-to-digital converter connected to said optical receiver for converting signals appearing on an output of said optical receiver into digital signals;

(g) a memory for storing information;

(h) a data register interposed between said memory and said analog-to-digital converter for storing the last information received from said analog-to-digital converter,

(i) a comparator means for comparing the information previously stored in said data register with information coming from said analog-to-digital converter for loading the information stored in said data register into said memory when said comparison indicates a predetermined difference

(j) a counter means producing a timing signal;

(k) means for supplying said timing signal to said analog-to-digital converter for synchronizing the loading of said data register and said comparator; and

(l) means for supplying said timing signal to said memory for recording the exact time said information is loaded into said memory from said data register.

4,100,488

APPARATUS FOR MEASURING ELECTRIC CURRENT

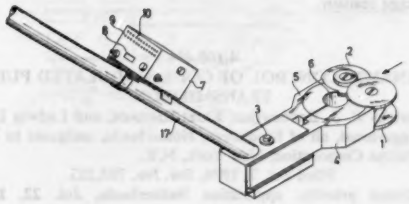
Gerhard Quietzsch, Bad Soden am Taunus; Bernd Greiner, Oberdorfelden, and Lothar Pelz, Oberroden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 29, 1976, Ser. No. 727,755

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543828

Int. Cl.[2] G01R *1/22*

U.S. Cl. 324—127 **2 Claims**



1. Apparatus for measuring the electrical power supplied to a load via a current conductor as determined by the direct current and superposed alternating current, comprising a pair of jaws pivotally coupled to each other, each of said jaws supporting a respective induction coil, said jaws being normally closed such that said respective induction coils substantially form a toroid; a recess portion in said jaws concentric with said toroid for receiving a current conductor; guide means disposed on said jaws in the vicinity of an end of said jaws remote from the pivotal coupling thereof, said guide means being formed of two rolls; means for moving said jaws toward and away from said current conductor such that forces are exerted on said jaws when said rolls contact said current conductor to urge said jaws to open whereby said guide means guide said current conductor to said recess portion whereat said jaws embrace said current conductor in said recess portion and to release said current conductor from said jaws, respectively; amplifier means coupled to said induction coils and including an integrator for integrating the direct current induced in said induction coils when said jaws are moved toward and embrace said current conductor, and an amplifier, filter and rectifier connected to sense the current induced in said induction coils by the alternating current flowing through said current conductor, and means for displaying an indication of the currents induced in said induction coils.

4,100,489

ELECTRICAL RESISTOR TESTING FIXTURE AND TESTING CHAMBER

Jerome J. Kneifel, and John C. Veburg, both of Columbus, Nebr., assignors to Dale Electronics, Inc., Columbus, Nebr.

Filed May 9, 1977, Ser. No. 795,138

Int. Cl.[2] G01R *31/00*

U.S. Cl. 324—158 F **9 Claims**

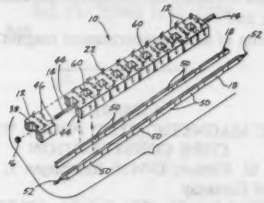
1. An electrical component testing chamber comprising, at least one modular test tray, at least one drawer having a top portion having a plurality of

grooves for receivably supporting said modular test trays in horizontal parallel alignment, a first plenum within said drawer having slots beneath said

grooves for allowing air flow and having an air inlet at one end of said drawer to receive air flow, a diffusing means covering said slots for maintaining uniform

air velocity through said slots, a support structure slidably supporting said drawers in vertical

alignment horizontally parallel to each other, a second plenum within said support structure having air outlets



meeting said drawer air inlets when the drawer is slidably engaged in said support structure, a valve means at said air outlet for controlling air flow into

said plenum, and means for discharging air into said second plenum.

4,100,490

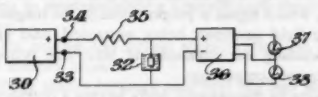
ELAPSED TIME INDICATOR AND ELECTROLYTIC TIMER CELL

David B. Peck; Vincent T. Guntlow, and Paul H. Netherwood, all of Williamstown, Mass., assignors to Diametrics, Inc., Williamstown, Mass.

Filed Mar. 11, 1977, Ser. No. 776,517

Int. Cl.[2] G04F *8/00*

U.S. Cl. 324—182 **21 Claims**



1. An elapsed time indicating cell comprising a valve-metal anode; a cathode being separated from said anode by a space; an electrolyte occupying said space; a housing containing said electrolyte; and an anodically formed oxide film overlying the surface of said anode, said film having a thickness corresponding to a formation voltage of less than 3 volts.

4,100,491

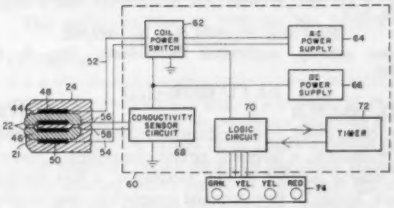
AUTOMATIC SELF-CLEANING FERROMAGNETIC METAL DETECTOR

Francis Marion Newman, Jr., and H. Stanley Silvus, Jr., both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Feb. 28, 1977, Ser. No. 772,658

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—204 **27 Claims**



22. A method of cleaning a ferromagnetic metal detector in a flowing fluid, said method having the following steps: mag-

netizing a semipermanent magnet which magnet is part of said metal detector;

collecting ferromagnetic particles on said magnetized semipermanent magnet;

demagnetizing said semipermanent magnet following detection of said particles;

releasing said collected ferromagnetic particles in said flowing fluid; and

remagnetizing of said semipermanent magnet.

4,100,492

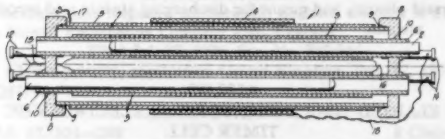
HARMONIC MAGNETIC FIELD PROBE WITH NOVEL CORE CONSTRUCTION

Friedrich M. O. Förster, D-7410 Reutlingen 1, In Laisen 70, Fed. Rep. of Germany

Filed Apr. 30, 1976, Ser. No. 681,814

Int. Cl.² G01R *33/04*

U.S. Cl. 324—254 **7 Claims**



1. In a harmonic magnetic probe for the measurement of magnetic fields or magnetic field gradients having at least one elongated magnetizable probe core, with at least one alternating current carrying excitation winding for effective alternating magnetic saturation of the probe core, and at least one receiver winding for providing an electric signal at the terminals of said winding, which signal is proportional to the magnetic fields or magnetic field gradients being measured, said electrical receiver winding encompassing at least one probe core, the improvement comprising:

an elongated diamagnetic body having a plurality of parallel straight-line openings extending therethrough, said openings having uniform cross-sections and arranged symmetrically about and equally spaced from a longitudinal axis of said body; and

a corresponding plurality of magnetizable wires individually received within the body openings, each of said wires having cross-sectional dimensions such that it is received within the body opening in a closely fitting relationship, said diamagnetic body and included wires forming a probe core.

4,100,493

TRANSMISSION SYSTEM FOR SIGNAL TRANSMISSION BY MEANS OF COMPRESSED DELTA MODULATION

Eise Carel Dijkmans, and Karel Elbert Kuijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

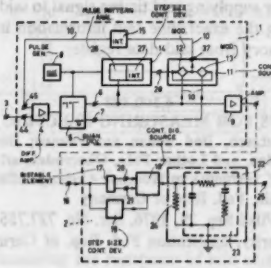
Filed May 25, 1976, Ser. No. 689,905

Claims priority, application Netherlands, Jun. 5, 1975, 7506656

Int. Cl.² H03K *13/22*

U.S. Cl. 325—38 B **2 Claims**

1. A compressed delta modulation transmitter comprising a delta modulator, a feedback circuit comprising a controlled signal source coupled to said modulator, a first integrating network having a first terminal coupled to said controlled signal source, a second terminal coupled to said modulator, and a third terminal, a leakage resistor coupled between said first and third terminals of said integrating network, and a capacitor coupled to said integrating network third terminal and ground, said signal source comprising a pair of current source means



for applying current pulses to said integrating network and said leakage resistor.

4,100,494

DYNAMIC CONTROL OF CODE MODULATED PULSE TRANSMISSION

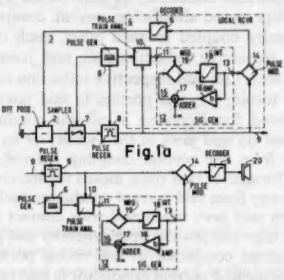
Henricus P. J. Boudewijns; Karel Riemens, and Ludwig D. J. Eggermont, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 7, 1976, Ser. No. 703,212

Claims priority, application Netherlands, Jul. 22, 1975, 7508711

Int. Cl.² H03K *13/22*

U.S. Cl. 325—38 B **8 Claims**



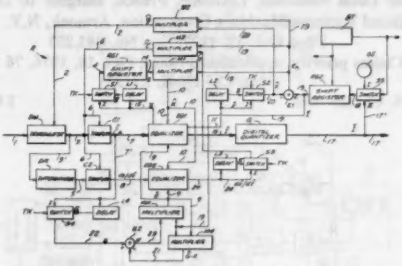
1. A transmitter for transmitting input signals in pulse code modulation format, said transmitter comprising a PCM modulator having input means for receiving said input signals, modulation control input means, and output means for supplying a PCM format signal to be transmitted with a given modulation index; a local receiver dynamic compression control circuit comprising a pulse train analyzer having an input coupled to said modulator output means and having an output means for supplying output pulses at the occurrence of pulse patterns in said PCM signal which correspond within a selected time interval of at least three successive pulses to a large instantaneous value of said modulation index, and a signal generator including an integrator network having an input, and an output means coupled to said modulator control input means for supplying a dynamic control signal thereto, and a feedback circuit coupled between said integrator input and output and including first device means coupled to said integrator output means for providing a signal having a magnitude with respect to said control signal in accordance with a selected ratio, and a second device means coupled to said analyzer output means, said first device means, and said integrator input for supplying said signal supplied by said first device means to said integrator in accordance with said output pulses.

4,100,495

ADAPTIVE METHOD OF AND MEANS FOR RECOVERING DIGITAL SIGNALS

Angelo Luvison, and Giancarlo Pirani, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni, Turin, Italy

Continuation-in-part of Ser. No. 745,800, Nov. 29, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,693
Claims priority, application Italy, Nov. 27, 1975, 69922 A/75
Int. Cl.[2] H04L *25/08*
U.S. Cl. 325—323 10 Claims



4. A receiver for an incoming data flow phase-modulated on a carrier arriving over a transmission channel, comprising:

demodulating means connected to said channel for recovering said data flow;

sampling means connected to said demodulating means for producing a train of raw data pulses under the control of a locally generated timing signal;

equalizing means connected to said sampling means for optimizing said raw data pulses by recursive filtering over a multiplicity of sampling cycles under the control of adaptive parameters including a gain coefficient and a channel coefficient, said equalizing means having a first output emitting the optimized data pulses, a second output emitting a reference signal internally synthesized from the vector sum of said raw data pulses weighted by said channel coefficient over said multiplicity of sampling cycles, and a third output emitting an updating signal internally synthesized from the vector sum of the differences between said raw data pulses and said reference signal obtained over said multiplicity of sampling cycles;

quantizing means connected to said first output for converting said optimized data pulses into outgoing data pulses;

storage means connected to said quantizing means for preserving said outgoing data pulses for a period corresponding to said multiplicity of sampling cycles;

adder means connected to said storage means and to said second output for differentially combining the preserved data pulses with said reference signal to produce an error signal;

a first feedback loop with input connections to said adder means and to said second output for delivering to a control input of said demodulating means an optimized phase signal derived from said error and reference signals;

a second feedback loop with input connections to said adder means and to said third output for delivering to said equalizing means an optimizing gain coefficient derived from said error and updating signals; and

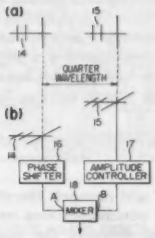
a third feedback loop with input connections to said sampling means and to said storage means for delivering to said equalizing means an optimized channel coefficient derived from said raw and stored data pulses.

4,100,496

GHOST CANCELLATION DEVICE

Tsuyoshi Akiyoshi; Namio Yamaguchi, and Keisuke Yamamoto, all of Ibaraki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 2, 1976, Ser. No. 738,105
Claims priority, application Japan, Dec. 11, 1975, 50-136518
Int. Cl.[2] H04B *1/18, 7/04*
U.S. Cl. 325—369 3 Claims



1. A ghost cancellation arrangement, comprising:

a first antenna bay for receiving a first desired signal M_1 and a first ghost signal G_1 having a different direction of arrival than the signal M_1;

a second antenna bay spaced from the first bay in a horizontal direction for receiving a second desired signal M_2 of the same frequency and arrival direction as the signal M_1, and a second ghost signal G_2 of the same frequency and arrival direction as the signal G_1,

means for mechanically and electrically arranging said antenna bays to provide output signals therefrom corresponding to approximately a ½ wavelength spacing therebetween;

a mixer for mixing the output signals from the first and second antenna bays;

phase shifting means between said first bay and said mixer for altering the phase of the signals M_1 and G_1;

amplitude controlling means between one of said bays and said mixer for altering the amplitudes of the corresponding output signals from said one bay; and

means for adjusting said phase shifting means and said amplitude controlling means so that the mixer output signal G_o corresponding to the resultant of the ghost signals G_1 and G_2 is in phase or 180° out of phase with the mixer output signal M_o corresponding to the resultant of the desired signals M_1 and M_2, whereby the undesirable effects of said ghost signals are substantially eliminated.

4,100,497

SELECTIVE RESCAN DELAY FOR MULTI-CHANNEL SCANNING RADIO RECEIVER

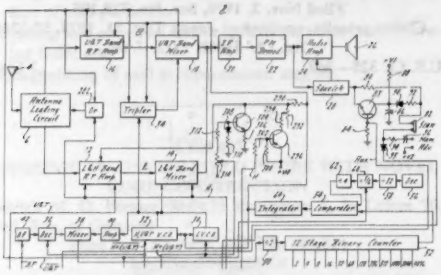
George H. Fathauer, Mesa, Ariz.; Cecil Ernest Mathis, and Warren L. Williamson, both of Indianapolis, Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Division of Ser. No. 545,432, Jan. 30, 1975, Pat. No. 4,027,251. This application Nov. 12, 1976, Ser. No. 741,475
Int. Cl.[2] H04B *1/32*
U.S. Cl. 325—470 7 Claims

4. In a multi-channel scanning radio receiver including scanning means for successively tuning to a plurality of predetermined radio frequency channels; means for detecting the presence of a signal on one of said tuned channels; means responsive to the detection of the signal on the tuned channel for halting said scanning means operation during said signal presence on said tuned channel and enabling resumption of said scanning means operation in response to termination of said signal on said tuned channel; and means responsive to said detection means for delaying the scanning means operation

resumption for a period of time after said signal termination, wherein the improvement comprises:

including memory means means for programming said delaying means to automatically operate only on certain



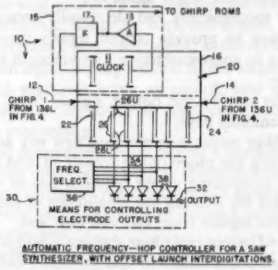
selected ones of said channels thereby facilitating reception of two-way communications on the certain selected channels without delaying the scanning operation on channels having one-way communications.

4,100,498

DISCRETE CHIRP FREQUENCY SYNTHESIZER

James M. Alsup, and Harper J. Whitehouse, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1977, Ser. No. 807,863
Int. Cl.[2] H03B *19/14, 21/02*
U.S. Cl. 328—14 **12 Claims**



AUTOMATIC FREQUENCY—HOP CONTROLLER FOR A SAW SYNTHESIZER, WITH OFFSET LAUNCH INTERDIGITATIONS.

1. An automatic frequency-hop controller for a surface acoustic wave (SAW) synthesizer, comprising:

a surface acoustic wave device, adapted to receive the chirp signals, comprising:

a substrate;

a pair of sets of interdigitated electrodes, disposed on the surface of the substrate, one set at each end, the electrodes receiving the electrical chirp signals and transducing them to acoustic waves, which traverse the surface of the substrate; and

another set of interdigitated electrodes, which are output electrodes, also disposed on the surface of the substrate, the electrodes of all sets being parallel, the output set of electrodes being so disposed as to receive the acoustic waves generated by the pair of sets of electrodes, and transduce them back to electrical signals;

means for generating two chirp signals, on a substrate, one chirp signal having a delay with respect to the other, the means of generating either chirp signal comprising a plurality of groups of electrodes, the upper half of each electrode being so disposed with respect to its lower half that the signal received from the top parts of the electrodes has a phase shift of 90°, at a carrier frequency f_o with respect to the phase shift of the signal received from the corresponding bottom parts of the electrodes; the synthesizer further comprising:

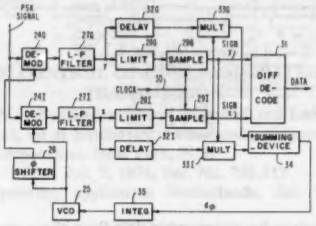
means, including switches which can be enabled, that is, activated, connected to the output set of electrodes, which selectively controls/mixes the transmission of the electrical signals received from the output set of electrodes, the selective controlling/mixing means having the capability of transmitting signals from the output set in any sequence, the frequency of the output signal being determined by the particular output switch which is activated at any given time.

4,100,499

CARRIER SYNCHRONIZATION SYSTEM FOR COHERENT PHASE DEMODULATORS

Jean Louis Monrolin, LaGaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 12, 1977, Ser. No. 841,257
Claims priority, application France, Oct. 18, 1976, 76 32450
Int. Cl.[2] H04L *27/22*
U.S. Cl. 329—50 **2 Claims**



1. In a 4-phase coherent PSK demodulator of the type that includes a phase adjustable reference carrier source,

means for demodulating a received signal with said reference carrier source to provide first and second signals respectively representing the in-phase and quadrature components of said received signal, a phase synchronization system for said reference carrier characterized in that it comprises:

means responsive to said first and second signals to detect the signs thereof and produce in-phase and quadrature sign signals,

multiplier means coupled to receive said first signal and said quadrature sign signal to produce a first product signal and to receive said second signal and said in-phase sign signal to produce a second product signal,

and means coupled to said multiplier means and responsive to said first and second product signals to produce an error signal, said error signal being supplied to said adjustable reference carrier source to control the phase thereof.

4,100,500

ANGLE-MODULATION DETECTOR HAVING PUSH-PULL INPUT APPLIED THROUGH HIGH-PASS FILTERS

Mitsuo Ohsawa, Fujisawa; Yukio Onoe, and Hiroshi Yamagishi, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 25, 1977, Ser. No. 827,797
Claims priority, application Japan, Aug. 27, 1976, 51-103053
Int. Cl.[2] H03D *3/14*
U.S. Cl. 329—103 **16 Claims**

1. A circuit adapted to detect an angle-modulated signal, comprising:

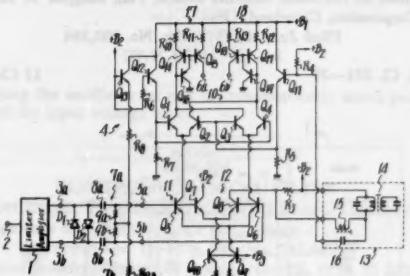
input means having a pair of terminals for supplying an angle-modulated signal to said pair of terminals in push-pull relation;

high-pass filter means coupled to said pair of terminals for transmitting that portion of said supplied angle-modulated signal which exceeds a cut-off frequency, said high-pass

filter means being formed of resistance means and capacitance means;

a differential amplifier having a pair of inputs coupled to said high-pass filter means for receiving the transmitted angle-modulated signal as a reference signal, said reference signal being applied to said pair of inputs in push-pull relation, and said differential amplifier having a pair of outputs;

quadrature generating means responsive to said reference signal for generating a quadrature signal whose phase varies with respect to said reference signal as a function of a change in frequency of said reference signal;



coupling means for coupling said reference signal to said quadrature generating means; and

multiplier means coupled to said pair of outputs of said differential amplifier for receiving output signals produced by said differential amplifier in response to said reference signal applied thereto, said multiplier means also being coupled to said quadrature generating means for receiving said quadrature signal to produce an output signal as a function of the phase difference between said reference and quadrature signals.

4,100,501

AUDIO FREQUENCY POWER AMPLIFIER

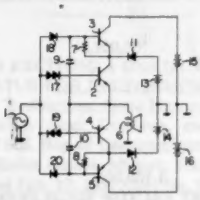
Haruhige Nakagaki, Yokohama; Tohru Sampei, Toyokawa; Nobutaka Amada, Toyokawa, and Tatsuo Baba, Toyokawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 11, 1977, Ser. No. 767,963

Claims priority, application Japan, Feb. 12, 1976, 51-13220; Feb. 18, 1976, 51-16012

Int. Cl.[2] H03F 3/26

U.S. Cl. 330—263 **8 Claims**



1. An audio frequency power amplifier comprising:

first and second transistors of one conductivity type each having an input electrode, a common electrode and an output electrode;

means for applying an input signal to the respective input electrodes of said first and second transistors;

a load connected to the output electrode of said first transistor;

a first D.C. power supply connected to the common electrode of said first transistor for energizing said first transistor and said load;

a diode connected between the common electrode of said first transistor and said first D.C. power supply in a forward direction to a current flowing from said first D.C. power supply;

means for D.C. coupling the common electrode of said first transistor to the output electrode of said second of transistor;

a second D.C. power supply connected to the common electrode of said second transistor and having a voltage higher than that of said first D.C. power supply for energizing said first and second transistors and said load when said second transistor is conductive;

a capacitor connected between the input electrode of said second transistor and the output electrode of said first transistor; and

means for charging up said capacitor when said second transistor is non-conductive.

4,100,502

CLASS B FET AMPLIFIER CIRCUIT

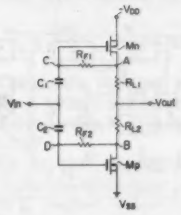
Osamu Yamashiro, Ohmiya, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 31, 1976, Ser. No. 719,238

Claims priority, application Japan, Sep. 3, 1975, 50-105919

Int. Cl.[2] H03F 3/16

U.S. Cl. 330—264 **15 Claims**



1. An FET circuit comprising an amplifier stage and a waveform shaping stage; said amplifier stage including a first p-channel FET and a first n-channel FET, means for biasing the gate of each of said FETs at a dc level nearly equal to its drain potential, (means for setting the potential differential between the source and the drain of each of said FETS at a voltage nearly equal to its threshold voltage;) and means for supplying a linear input signal to said gates through respective capacitors; and said waveform shaping stage comprising means for converting a linear signal into a digital signal including a second p-channel FET having a gate coupled to the drain of said first p-channel FET, and a second n-channel FET having a gate coupled to the drain of said first n-channel FET.

4,100,503

CORRELATIVE TRACKING SYSTEM WITH LOCK INDICATOR

William C. Lindsey, Pasadena, Calif.; Heinrich Meyr, Hinterkappelen, Switzerland, and Peter C. King, Ventura, Calif., assignors to W. C. Lindsey Inc., Pasadena, Calif.

Filed Jul. 21, 1976, Ser. No. 707,285

Int. Cl.[2] H03B 3/04

U.S. Cl. 331—1 A **4 Claims**

1. In a correlative tracking system having an in-phase phase locked loop including a multiplier, a low pass filter and a VCO having an output signal, said multiplier having a carrier signal input and said VCO output signal as an input, said multiplier having a positive or a negative output signal proportional to in-phase or out-of-phase phase difference between said carrier signal and said VCO output signal, said correlative tracking

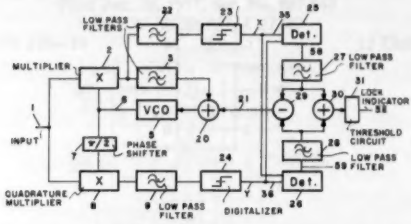
system also having a quadrature multiplier having an input receiving said carrier signal and an input receiving a $\pi/2$ phase shifted replica of said VCO output signal, said quadrature multiplier having a positive or negative output proportional to in-phase or out-of-phase phase difference between said carrier signal and said phase shifted replica of said VCO output signal, said quadrature multiplier connected to a quadrature low-pass filter having an output indicating the locked status of said in-phase phase locked loop by comparison with a threshold, the improvement which comprises:

a first low pass filter having an input connected to said in-phase phase locked loop multiplier output, said low pass filter having an output;

a first digitizing means having an input connected to said first low pass filter output, said first digitizing means adapted to produce a positive pulse corresponding to $x=1$ or a negative pulse corresponding to $x=0$ when said output of said in-phase phase locked loop multiplier shifts positive or negative;

a second digitizing means having an input connected to said quadrature low pass filter output, said second digitizing means adapted to produce a positive pulse corresponding to $y=1$, or a negative pulse corresponding to $y=0$, when said quadrature multiplier output shifts positive or negative;

first detector means receiving positive and negative pulses corresponding to x, y=00, 10, 11, 01, produced by said first and second digitizing means, said first detector means having at least one output pulse when said positive and negative pulses corresponding to x, y=00, 10, 11, 01, have been received;



a second low pass filter receiving said output pulse of said first detector means, said second low pass filter having an output;

a second detector means receiving the reverse order of said positive and negative pulses, corresponding to x, y=00, 01, 11, 10, produced by said first and second digitizing means, said second detector means having at least one output pulse when the reverse order of said positive and negative pulses, corresponding to x, y=00, 01, 11, 10, has been received;

a third low pass filter connected to said output of said second detector means, said third low pass filter having an output;

a first adder connected to said second and said third low pass filter outputs, said first adder adapted to sum a plurality of pulses received from said second and said third low pass filter outputs, said first adder having an output signal proportional to said sum;

a comparator having an input connected to said first adder output, said comparator adapted to compare said sum with a threshold and to produce a signal when said threshold is exceeded, indicating an out of lock status;

differencing means connected to said second and third low pass filter outputs, said differencing means adapted to subtract the number of pulses received from said second low pass filter output from pulses received from said third low pass filter output, said differencing means having an output proportional to said difference; and

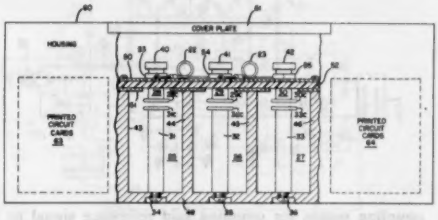
a second adder having a first input connected to said in-phase phase locked loop low pass filter output, a second input connected to said differencing means, and an output connected to said VCO, said second adder adapted to algebraically add said signal proportional to said difference from said differencing means, to said phase locked loop low pass filter output, to control said VCO.

4,100,504

BAND REJECTION FILTER HAVING INTEGRATED IMPEDANCE INVERTER-TUNE CAVITY CONFIGURATION

William E. McGann, Satellite Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Jun. 20, 1977, Ser. No. 808,364
Int. Cl.[2] H03B *21/02*
U.S. Cl. 331—39 **11 Claims**



1. A band rejection filter arrangement comprising:

an input terminal to which an input signal having a prescribed frequency component to be effectively rejected is to be coupled;

an output terminal from which an output signal absent said prescribed frequency component is to be derived;

a plurality of impedance inverter elements connected in series between said input and output terminals; and

respective tunable resonator cavity elements connected between the junctions of commonly connected impedance inverter elements and a reference potential terminal; wherein

one end of each of said resonator cavity elements is formed of an insulator board having first conductive material disposed on the side thereof facing each cavity; and wherein

on the side of said insulator board facing away from each cavity there is provided a second conductive material, which is connected to said first conductive material, and upon which ones of said impedance inverter elements are affixed.

4,100,505

VARIABLE CREST FACTOR HIGH FREQUENCY GENERATOR APPARATUS

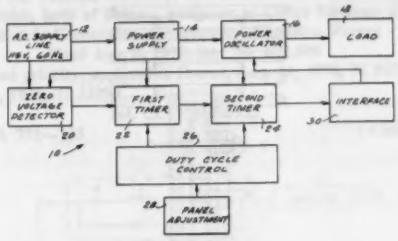
Kenneth W. Belt, Berwyn, and Stuart G. McCarrell, Chicago, both of Ill., assignors to Macan Engineering & Manufacturing Company, Inc., Chicago, Ill.

Filed May 7, 1976, Ser. No. 684,082
Int. Cl.[2] A61B *17/36*
U.S. Cl. 331—71 **11 Claims**

1. A method of producing high frequency signal bursts, comprising the steps of:

applying a rectified sinusoidal input voltage to an oscillator

to produce high frequency oscillations having an envelope which follows the input voltage wave;
simultaneously monitoring the input voltage wave; and



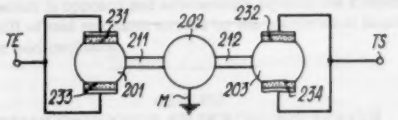
keying the oscillator on and off symmetrically about peaks of the input voltage wave.

4,100,506

ELECTROMECHANICAL FILTER

Herbert Ernyei, Paris, France, assignor to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Nov. 17, 1976, Ser. No. 742,467
Claims priority, application France, Nov. 20, 1975, 75 35515
Int. Cl.[2] H03H *9/04, 9/26, 9/32;* **H04R** *1/22*
U.S. Cl. 333—71 **3 Claims**



1. An electromechanical filter, having a single narrow pass band, comprising:
a plurality of resonators of generally cylindrical shape spaced from each other and having their longitudinal axes parallel and lying in a common plane;
coupling rods extending between and connecting each adjacent pair of said resonators, said rods having their longitudinal axes substantially perpendicular to the longitudinal axes of said resonators;
a pair of floats formed along each outermost resonator of said plurality, said flats being parallel to the longitudinal axes of said coupling rods; and
two pairs of electromechanical transducers, one pair coupled respectively to each pair of said flats to enable input and output connections to the filter.

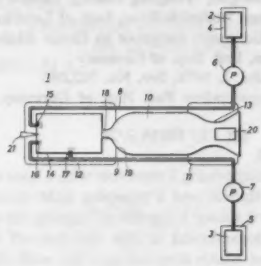
4,100,507

METHOD FOR EXCITING A GAS DYNAMIC CO_2 LASER AND APPARATUS FOR PERFORMING THE METHOD

Gunthard Born, Taufkirchen; Hans Hermansdorfer, Unterpfaffenhofen; Gunther Sepp, Ottobrun, and Gerhard Grosch, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 17, 1977, Ser. No. 769,780
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2608305
Int. Cl.[2] H01S *3/02*
U.S. Cl. 331—94.5 G **10 Claims**

6. A gas dynamic CO_2 laser comprising combustion chamber means, resonator means, nozzle means interconnecting said combustion chamber means and said resonator means, said nozzle means having an exit cross sectional area and entrance cross sectional area, said exit cross sectional area being at least 100 times larger than said entrance cross sectional area, diffuser means operatively connected to said resonator means, first cooling jacket means arranged around said diffuser means, second cooling jacket means arranged around said combustion chamber means and around said nozzle means, first container means for a liquid fuel, second container means for a liquid oxidizer, injection nozzle means leading into said combustion chamber means, liquid conveying means operatively connecting said injection nozzle means to the respective one of said



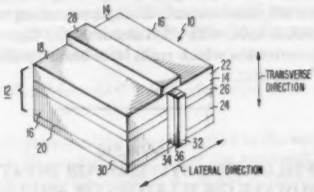
first and second container means, said liquid conveying means including liquid conduit means extending through said first and second cooling jacket means, and wherein said combustion chamber means, said nozzle means, and said diffuser means have corrosion resistant inner surfaces, said laser further comprising gas afterburner means operatively connected to said diffuser means.

4,100,508

SEMICONDUCTOR LASER HAVING FUNDAMENTAL LATERAL MODE SELECTIVITY

James Pleister Wittke, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,512
Int. Cl.[2] H01S *3/19*
U.S. Cl. 331—94.5 H **6 Claims**



1. A semiconductor laser capable of fundamental lateral mode selectivity having an optical waveguide which substantially confines optical radiation capable of being generated therein, which comprises:
a rectangular parallelepiped body of semiconductor material having opposed end surfaces, opposed side surfaces extending to said end surfaces, and opposed first and second contact surfaces extending to said end surfaces and said side surfaces, said optical waveguide extending from one end surface to the opposite end surface;
a stripe contact on said first contact surface, said stripe contact being spaced from said side surfaces and extending to said end surfaces, said stripe contact defining the lateral width of said optical waveguide;
an opposite contact on said second contact surface; and
optical reflective means contiguous to the waveguide at the end surfaces, said optical reflective means at at least one of said end surfaces being only within the lateral width of the optical waveguide and having a width in the lateral direction less than the spatial width of the fundamental lateral mode radiation in the absence of the reflective means so as

to provide the fundamental lateral mode radiation with greater reflectivity than the higher order lateral mode radiations.

4,100,509

DYESTUFF LASER

Herbert Walther, Cologne; Wolfgang Hartig, Essen-Haarzopf; Adolf Friedrich, and Roderich Raue, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

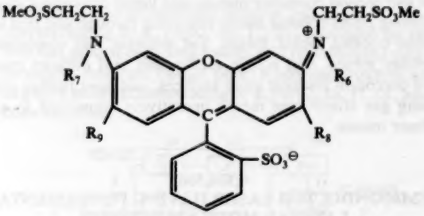
Filed Jul. 2, 1976, Ser. No. 702,080

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2529903

Int. Cl.² H01S *3/20*

U.S. Cl. 331—94.5 L 1 Claim

1. Dyestuff laser comprising a reservoir with a laser dyestuff solution contained therein and a pumping light source connected thereto, which source is capable of exciting the dyestuff solution to emit, characterised in that the dyestuff solution contains, in a solvent which does not interfere with the emission, a dyestuff of the general formula



wherein

R_6 and R_7 represent hydrogen,

R_8 and R_9 denote hydrogen or alkyl radicals with 1-2 C atoms and

Me represents hydrogen, potassium, sodium, ammonium, monoalkylammonium, dialkylammonium or trialkylammonium ions, with alkyl denoting C_1–C_4,

in a concentration which emits laser beams, preferably of 10^{-2} to 10^{-5} mol/liter.

4,100,510

STABILIZATION SYSTEMS FOR IMPATT DIODE MICROWAVE OSCILLATORS OR AMPLIFIERS, AND SIMILAR ACTIVE COMPONENTS

Marcello Reggiani, and Franco Marchetti, both of Rome, Italy, assignors to Selenia-Industrie Elettroniche Associate S.p.A., Italy

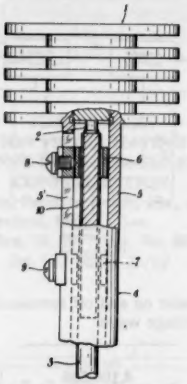
Continuation of Ser. No. 694,856, Jun. 10, 1976. This application Aug. 22, 1977, Ser. No. 826,795

Claims priority, application Italy, Jul. 7, 1975, 50398 A/75

Int. Cl.² H03B *7/14*

U.S. Cl. 331—107 R 7 Claims

1. A stabilization system for an impatt-diode microwave oscillator comprising a power supply feed conductor having a substantially filamentary conducting element; support means for electrically and mechanically supporting an impatt-diode, said support means having a return conductor for the diode and a thermal dissipator and forming one terminal of a transmission line; and a ferrite member inductively associated with said power supply feed conductor and adjacent said support means to be in the immediate proximity of the impatt-diode where the electromagnetic field in the operating oscillation mode and at the operating frequency is intense, said ferrite member having a longitudinal size that is great with respect to the transverse size thereof and being formed of a material causing said ferrite member to have negligible losses at the microwave oscillator operating frequencies and high losses at



frequencies ten or more times lower than the microwave oscillator operating frequencies.

4,100,511

DELAY LINE OSCILLATOR LOCKED TO A SELECTED FREQUENCY OF A CHIRP DELAY LINE

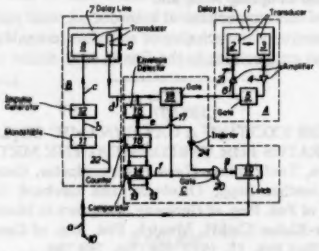
Philip Henry Wisbey, Colchester, England, assignor to The Marconi Company Limited, England

Filed May 20, 1977, Ser. No. 799,085

Claims priority, application United Kingdom, May 28, 1976, 22476/76

Int. Cl.² H03B *3/06, 5/32*

U.S. Cl. 331—107 A 3 Claims

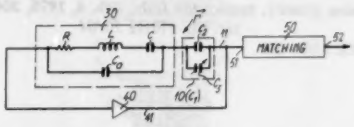


1. A delay line oscillator arrangement including a closed loop delay line oscillator, and a chirp delay line for producing a range of frequencies, means for locking the closed loop oscillator onto one of the frequencies produced by the chirp delay line, and control means arranged to produce timing signals derived from signals produced by the chirp delay line for gating said one of the frequencies produced by the chirp delay line to the delay line oscillator to determine its frequency of oscillation.

4,100,512
CRYSTAL OSCILLATOR COMPENSATED AGAINST FREQUENCY SHIFT DUE TO ACCELERATION

Michel M. Valdois, Chatillon, and Armand B. Dupuy, Cergy-Pontoise, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed Aug. 8, 1977, Ser. No. 822,889
Claims priority, application France, Aug. 11, 1976, 76 24571; Aug. 4, 1977, 77 23990
Int. Cl.² H03B 5/32
U.S. Cl. 331—158 7 Claims



1. In an oscillation sustaining loop of an electrical oscillator, that improvement comprising:

a resonator having a piezoelectric crystal;

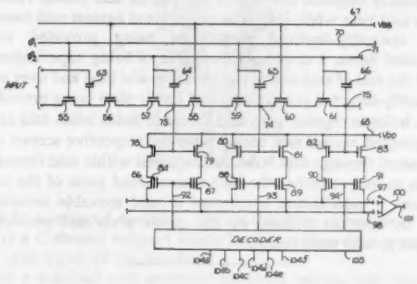
an adjusting capacitance for adjusting the resonator frequency which is connected in series with said resonator, said adjusting capacitance being formed of at least one variable capacitor; and

means sensitive and responsive to acceleration imposed on said oscillator for controlling said variable capacitor whereby the frequency shift caused by said variable capacitor is opposed and substantially equal to the frequency shift of said resonator caused by the acceleration imposed on said oscillator.

4,100,513
SEMICONDUCTOR FILTERING APPARATUS

Gene P. Weckler, Campbell, Calif., assignor to Reticon Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 687,370, May 17, 1976, which is a continuation-in-part of Ser. No. 614,655, Sep. 18, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,596
Int. Cl.² H03H 7/10, 7/28, 7/30; H03K 5/159
U.S. Cl. 333—70 T 13 Claims



1. In a semiconductor filter which includes a charge transfer means for transferring an input signal, said transfer means including a plurality of nodes for sensing charge in said transfer means, an improvement for selectively coupling said nodes comprising:

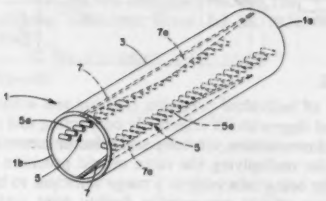
a plurality of electrically programmable MOS devices each of which includes a pair of spaced apart regions disposed in a substrate and a floating gate insulation from, and disposed above, said substrate, each of said floating gates being completely surrounded by oxide, each of said devices being coupled to one of said nodes;

whereby a connection, or open connection, may be made to nodes in said transfer means by selectively injecting charge onto said floating gates thereby permitting programming of said filter.

4,100,514
BROADBAND MICROWAVE POLARIZER DEVICE

Joseph G. DiTullio, Woburn, and Leonard I. Parad, Framingham, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 28, 1977, Ser. No. 791,969
Int. Cl.² H01P 1/18
U.S. Cl. 333—31 A 6 Claims



1. A broadband microwave polarizer device for introducing a relatively constant phase shift between orthogonal components of signals over a predetermined bandwidth, comprising:

a section of waveguide having an input end for receiving signals having orthogonal components between which a phase shift is to be introduced, and an output end;

a pair of opposing rows of pins at inner surface regions of the waveguide, said rows of pins being in a common, first plane; and

a pair of opposing ridges at other inner surface regions of the waveguide, said ridges being in a common, second plane at an angle to the first plane;

said polarizer device being operative to introduce a phase shift between orthogonal components of signals applied to the input end of the section of waveguide, the phase shifted orthogonal components of the signals appearing at the output end of the section of waveguide, the phase shift introduced between the orthogonal components of the signals applied to the section of waveguide being approximated by

$$\phi_{\frac{s}{f_0)^2}} = A_0 - B_0 + (A_1 - B_1)(f - f_0) + (A_2 - B_2)(f -$$

where f is the frequency of the signals applied to the section of waveguide, f_0 is the center frequency of the bandwidth over which the polarizer device operates, A_0, A_1 and A_2 are constants associated with the rows of pins, B_0, B_1 and B_2 are constants associated with the pair of opposing ridges;

the characteristics of the rows of pins and the pair of ridges being selected so that the constants A_1 and B_1 are negative with the value of the constant A_1 being equal to the value of the constant B_1, and so that the constants A_2 and B_2 are positive and essentially equal in value, whereby the phase shift introduced between the orthogonal components of signals applied to the section of waveguide is nearly constant over the bandwidth of the polarizer device.

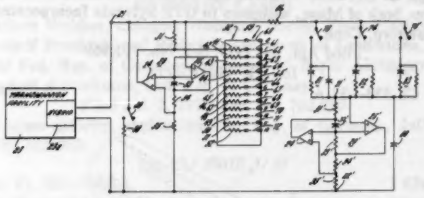
4,100,515
COMMUNICATION CIRCUIT HAVING PRECISION CAPACITOR MULTIPLIER

Shanti Swarup Gupta, Naperville, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed May 5, 1977, Ser. No. 794,002
Int. Cl.² H03H 7/44, 11/00
U.S. Cl. 333—80 R 8 Claims

1. In transmission facilities of the type capable of exhibiting a shunt capacitance within a predetermined range dependent on the physical characteristics of the facility, a precision capacitor multiplier in said facility comprising, terminal means con-

nected to said facility, first through fifth impedances serially connected between said terminal means, first and second amplifier means connected to said serially connected impedances to form a gyrator circuit, the centermost one of said impedances being a precision capacitor, the other four of said impedances being resistors, at least one of said resistors comprising a



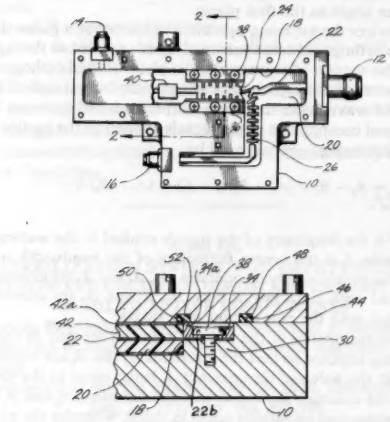
plurality of individual precision resistors and selector means associated therewith for selectively connecting said resistors in said serial connection, whereby said selector means establishes a factor for multiplying the value of said precision capacitor, said factor being selectable in a range sufficient to balance the capacitance of said transmission facility over said predetermined range.

4,100,516

MICROWAVE CIRCUIT HAVING GROUNDING STRUCTURE

Roger D. Hall, Encino, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Mar. 18, 1977, Ser. No. 779,128
Int. Cl.² H01P 5/12, 1/00
U.S. Cl. 333—6 **8 Claims**



1. In a microwave stripline circuit including two adjacent dielectric substrate members having conductive ground planes on their nonadjacent surfaces;

a chassis of electrically conductive material enclosing said substrate members in contact with said ground planes, said chassis including two members and means for fastening said chassis members, together, an internal chamber being formed in said chassis adjacent said substrate members, one of said chassis members having a length of conductive elastomeric material in its surface facing said chamber,

a stripline conductor positioned between the adjacent surfaces of said dielectric substrate members having an extension into said chamber, and

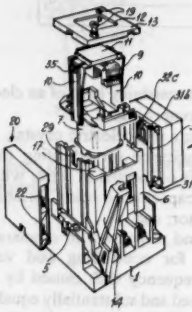
means for securing said extension tightly against a wall of said chamber, said means including a shorting bar having a projection of slightly greater length than the height of said chamber such that said projection penetrates said conductive elastomer when said chassis members are fastened together.

4,100,517

ELECTRICAL CONTACTORS

Giorgio Rodolfi, Varese, Italy, assignor to Bassani Ticino S.p.A., Milan, Italy

Filed Jan. 31, 1977, Ser. No. 764,452
Claims priority, application Italy, Feb. 6, 1976, 304 A/76
Int. Cl.² H01H 50/04
U.S. Cl. 335—132 **7 Claims**



1. An electrical contactor comprising a rectangular base carrying at least one pair of spaced fixed contacts, a movable support element carrying movable contacts and disposed on said base, a prismatic casing disposed on said base with its axis perpendicular to said base and having its respective ends open, a solenoid disposed within and supported by said casing and comprising a movable armature having two parallel legs directed towards said base with their free ends resting on said movable support element, two arms hinged to said base near a pair of diagonally opposed corners of the base and having inwardly-directed projections arranged to engage a pair of diagonally opposed corners of the end of said casing remote from said base when said arms are pivoted against said casing, said inwardly-directed projections being provided with threaded holes, a cover plate capable of being superimposed over the end of said casing remote from said base and over said inwardly-directed projections, said cover plate being provided with holes in register with said threaded holes when said arms are pivoted against said casing whereby respective screws can be passed through said holes and engaged within said threaded holes to lock together the above-mentioned parts of the contactors, a push-button connected to said movable armature, and an aperture defined by the cover plate and providing access to said push-button.

4,100,518

ECCENTRIC CONVERGENCE APPARATUS FOR IN-LINE BEAM CATHODE RAY TUBES

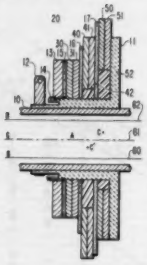
Joseph Leland Smith, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,464
Int. Cl.² H01J 29/68
U.S. Cl. 335—212 **5 Claims**

2. A convergence device for moving the outer beams of three in-line electron beams within the envelope of a cathode ray tube, comprising:

first magnetic field producing means rotatable about at least a part of a circumference of said envelope for effecting movement of said first outer beam in any direction, said

first magnetic field producing means including a first zero magnetic field point located within said envelope between the central beam and the second outer beam for maintaining substantially no movement of said central and second outer beams during rotation of said first magnetic field producing means; and



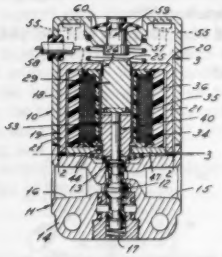
second magnetic field producing means concentrically located and rotatable about at least a part of a circumference of said envelope for effecting movement of both of said outer beams in any direction while maintaining substantially no movement of said central beam during rotation of said second magnetic field producing means, said first and second means combined for converging said outer beams onto said central beam.

4,100,519

ALIGNMENT MEANS FOR A MOVEABLE POLE-PLUNGER ASSEMBLY

James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to MAC Valves, Inc., Wixom, Mich.

Filed Dec. 31, 1975, Ser. No. 645,915
Int. Cl.² H01F 7/08
U.S. Cl. 335—262 **15 Claims**



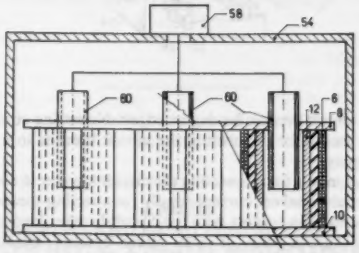
1. In a solenoid assembly, the combination comprising:
(a) a C-shaped support frame having a transverse member and a pair of leg members;
(b) a solenoid coil assembly mounted within said support frame;
(c) a flux plate releasably mounted between said support frame leg members for retaining said coil assembly against endwise movement in said support frame;
(d) mating retainer means on said coil assembly and said support frame for retaining the coil assembly against sidewise movement in said support frame;
(e) a pole piece movably mounted in an axial bore through said coil assembly and being guided for axial movement by a first bushing mounted in said flux plate;
(f) means for normally biasing said pole piece outwardly of said axial bore in said coil assembly;
(g) a solenoid plunger movably mounted in said axial bore in said coil assembly and being guided for axial movement by a second bushing mounted in said support frame transverse member; and,
(h) means in said axial bore of said coil assembly and in spaced apart relation to said coil assembly and in close sliding engagement with said solenoid plunger and pole piece for aligning said solenoid plunger and pole piece.

4,100,520

DEVICES FOR CONTROLLING A.C. MOTORS

Mendel Krichevsky, Beer-Sheva, Israel, assignor to Ben-Gurion University of the Negev Research and Development Authority, Beer-Sheva, Israel

Filed Jul. 22, 1975, Ser. No. 595,726
Claims priority, application Israel, Jul. 28, 1974, 45360; Jul. 7, 1975, 47648
Int. Cl.² H01F 21/02, 17/06
U.S. Cl. 336—30 **23 Claims**



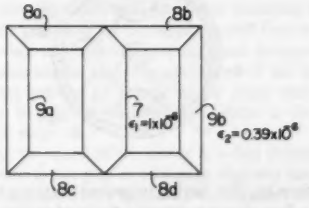
1. A device for controlling an A.C. motor having an electromagnetic field inducing coil witn an axis wound around a conductive element wherein said element comprises at least one inwardly directed opening bound by surface areas of said element and having a gap *a* between said surface areas defined by the formula $a \geqq \delta$, wherein δ is the wave penetrating depth of an instantaneous operating frequency of induced electromagnetic energy, said gap defining an open space within the confines of said element and further characterized in that said coil is wound so as to surround said open space and said element for inducing flux along walls of said element, whereby the exposed surface area of said element is in effect increased for increasing the absorption of the induced energy.

4,100,521

IRON CORE FOR INDUCTION APPARATUSES

Yasuro Hori, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

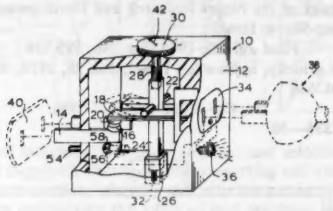
Filed Apr. 15, 1975, Ser. No. 568,192
Int. Cl.² H01F 27/24
U.S. Cl. 336—100 **8 Claims**



1. In an iron core for induction apparatuses comprising at least one main leg to be mounted with windings and at least a pair of yokes joined with said main legs, each including a plurality of laminations of silicon steel, the improvement wherein said yokes are formed of silicon steel having a lower magnetostriction with respect to a given magnetic flux density than that of the silicon steel of said main legs, and the magneto-

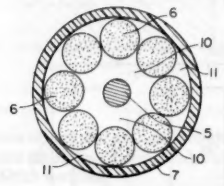
striction of said main legs is at least double that of said yokes with respect to said given magnetic flux density.

4,100,522
CIRCUIT BREAKER WITH ADJUSTABLE SETTING
Jacob Waszmer, 15 E. Bedell St., Freeport, N.Y. 11520
Filed Nov. 22, 1976, Ser. No. 744,163
Int. Cl.² A01H *61/08*
U.S. Cl. 337—68 **10 Claims**



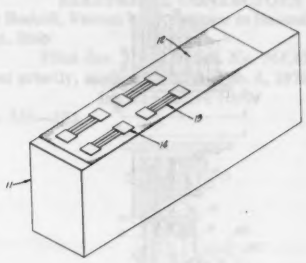
1. A circuit breaker having an adjustable setting comprising:
plug means for connecting the circuit breaker to a current supply;
socket means for connecting the circuit breaker to a load, the circuit-breaker current-supply connecting-means being normally in contact with the circuit-breaker load-connecting means, one of said circuit-breaker means being adapted to be released from contact with the other of said circuit-breaker means at a predetermined release point upon the application of a predetermined amount of heat to said circuit-breaker means; and
adjustment means for varying the release point of said one of said circuit-breaker means from the other of said circuit-breaker means, whereby, upon a predetermined current passing through said circuit-breaker means, said one of said circuit-breaker means is heated to said predetermined amount of heat and released from contact with the other of said circuit-breaker means.

4,100,523
TIME-LAG FUSE
Hiroo Arikawa, Tokyo, and Masaya Maruo, Yokohama, both of Japan, assignors to San-O Industrial Co., Ltd., Tokyo, Japan
Filed Nov. 19, 1976, Ser. No. 743,314
Claims priority, application Japan, Nov. 26, 1975, 50-159303
Int. Cl.² H01H *85/04, 85/18*
U.S. Cl. 337—163 **1 Claim**



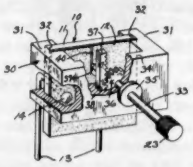
1. A time-lag fuse having improved breaking capacity comprising a fuse element securely disposed within an insulating cylindrical tube, a plurality of sintered ceramic bodies circumferentially disposed within said insulating cylindrical tube in spaced relation to said fuse element, each adjacent pair of said ceramic bodies defining a space between them and said insulating cylindrical tube for buffering the pressure produced by the arc between said ceramic bodies and said insulating cylindrical tube.

4,100,524
ELECTRICAL TRANSDUCER AND METHOD OF MAKING
Thomas Kirsch, Oxnard, Calif., assignor to Gould Inc., Cleveland, Ohio
Filed May 6, 1976, Ser. No. 683,714
Int. Cl.² G01L *1/22*
U.S. Cl. 338—2 **6 Claims**



2. A strain gage, comprising:
an electrically conductive substrate;
an insulating layer on said substrate; and
an electrical current conducting element on said insulating layer consisting essentially of 65%–70% by weight of chromium, 18%–32% by weight of silicon monoxide and 3%–12% by weight of nickel.

4,100,525
SINGLE SETTING VARIABLE RESISTOR
Oscar L. Denes, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.
Filed May 10, 1976, Ser. No. 684,709
Int. Cl.² H01C *10/00*
U.S. Cl. 338—195 **10 Claims**

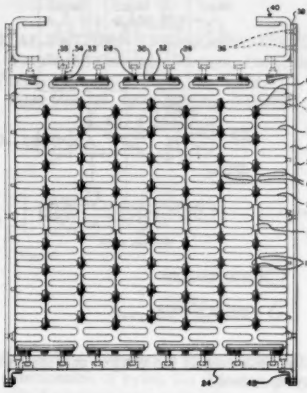


1. A kit which makes possible trimming adjustment in the field of the resistance of a resistor adapted for connection into an electrical circuit, said kit comprising:
a. a trimmable resistor having a substrate, a resistive layer deposited upon at least a portion of said substrate, laterally spaced terminal members in electrical connection with said resistive layer and arranged for connection with the electrical circuit, at least a portion of said resistive layer being penetrable and removable for in situ trimming adjustment of said resistor;
b. a manually operable scribing tool for in situ penetration and removal of said portion of said resistive layer to trim the resistance of the resistor;
c. means for orienting said scribing tool in trimming relationship with said resistor.

4,100,526
GRID RESISTOR

Victor V. Kirilloff, Murrysville, and William A. Benson, Pittsburgh, both of Pa., assignors to Mosebach Manufacturing Company, Pittsburgh, Pa.

Filed Feb. 24, 1977, Ser. No. 771,685
Int. Cl.[2] H01C *3/00*
U.S. Cl. 338—279 1 Claim



1. A resistor structure forming a grid in a frame having a plurality of longitudinal fan folded electrically conductive resistive ribbons forming tips and supported within the frame wherein the improvement comprises:

(a) a support strip member of electrically conductive material and positioned longitudinally between two adjacent resistive ribbons, the strip member having a plurality of holes with bushings of electrical insulation material inserted in the holes, the ends of the strip member are free and are spaced from the frame;

(b) studs selectively joined to the tips of the resistive ribbons and alternating between tips of the resistive ribbon on one side of the support strip member and tips of the resistive ribbon on the other side of the support strip member, the studs each engage one of the bushings and only one tip with a stud engages each bushing and the tips with the studs abut the bushings engaged, tips without studs are spaced from the support strip member and the tips without studs which are transversely aligned with a bushing abut that bushing; and

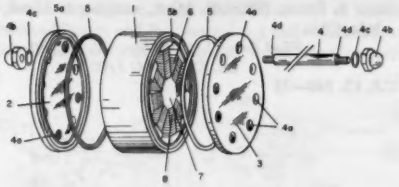
(c) a bumper member of electrical insulation material joined on a top edge of the support.

4,100,527
MULTI-DRIVER PIEZOELECTRIC TRANSDUCERS WITH SINGLE COUNTER-MASSES, AND SONAR ANTENNAS MADE THEREFROM

Bernard Tocquet, Sanary, France, assignor to Etat Francais, Paris, France

Filed Feb. 24, 1976, Ser. No. 661,043
Claims priority, application France, Feb. 27, 1975, 75 06079
Int. Cl.[2] H04B *13/00*
U.S. Cl. 340—10 7 Claims

1. A piezoelectric transducer adapted to be immersed in water at great depths, comprising a substantially cylindrical envelope which is rigid in respect of its inner wall, a plurality of piezoelectric drivers disposed within said envelope, each driver being constituted by a stack of piezoelectric elements alternating with electrodes, said envelope being solid and constituting a tight hoop about said piezoelectric drivers, at least one pre-stressing rod for compressing each said stack, an intermediate member common to all of said drivers, to which member said drivers are each secured by said rod, said intermediate member also acting as a counter-mass for said drivers, end pieces for said drivers, said rods passing only through said end pieces and said drivers into said intermediate member, said

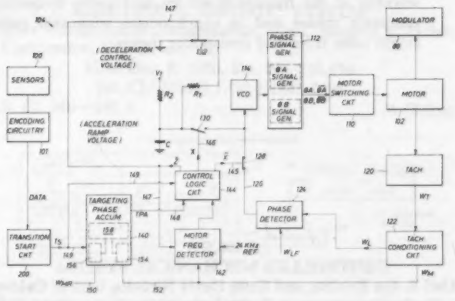


envelope being non-perforate and being applied to said end pieces as said tight hoop to apply radial stresses thereto which additionally compress said stacks.

4,100,528
MEASURING-WHILE-DRILLING METHOD AND SYSTEM HAVING A DIGITAL MOTOR CONTROL

James I. Bernard, Houston, and Gerald A. Strom, Dayton, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,686
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—18 LD 22 Claims



19. In a measuring-while drilling system including a motor driven acoustic generator for imparting to well fluid an acoustic signal having an intermittently constant frequency, the method of momentarily changing the speed of the motor to effect a desired amount of change in the phase state of the signal thereby to provide encoded data states to the signal, comprising the steps of:

(a) changing the speed of the motor in a first direction;

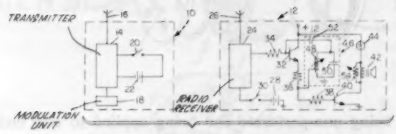
(b) in response to the step of changing, digitally integrating the instantaneous motor speed and the constant frequency motor speed, to thereby generate a pair of digital signals, the difference between said digital signals being indicative of the change in phase of the acoustic signal caused by the changing of the motor speed; and

(c) stopping said motor speed change in the first direction when the difference between said digital signals reaches a predetermined value indicative of a predetermined phase shift which is less than the desired change in phase.

4,100,529
ROAD HAZARD WARNING SYSTEM, INDICATING SPECIFIC HAZARD

Edgar J. Evans, Hillsdale, Mich., assignor to Mews, Inc., Toledo, Ohio

Filed Sep. 13, 1976, Ser. No. 722,691
Int. Cl.[2] G08G 1/00
U.S. Cl. 340—32 **3 Claims**



1. In a warning system to enable drivers of vehicles to be alerted to the presence of road hazards, the combination which comprises:

transmitter means associated with said road hazards for transmitting a pulse length coded radio frequency signal that is unique for each particular road hazard;

receiver means carried by said vehicles for receiving said pulse length coded signal;

audio frequency generator means, comprising an audio frequency circuit connected in a feedback loop of a transistor amplifier, connected with said receiver means for further modulating said pulse length coded signal at an audio frequency, the period of oscillation of said audio frequency circuit serving to modulate said pulse length coded signal without disturbing said pulse length code;

a visible light emitting means connected to the output of said audio frequency generator means for flashing in synchronism with said pulse length code signal from said transmitter; and

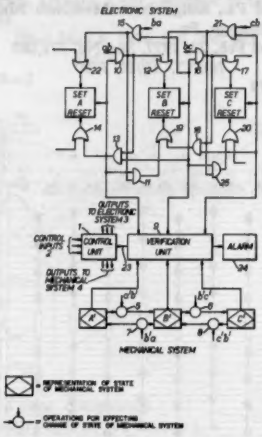
an audible sound emitting means connected in series with said visible light emitting means for sounding an audible warning at the frequency set by said audio frequency generator means and in synchronism with said pulse length code from said transmitter means.

4,100,530
CONTROLLED MECHANICAL SYSTEM

Carl S. den Brinker, and Keith David Nicholls, both of Oakley, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1975, Ser. No. 642,214
Int. Cl.[2] B60Q 9/00
U.S. Cl. 340—53 **10 Claims**

1. A controlled mechanical system comprising a control system and a mechanism which is required to assume individual ones a plurality of different states at different times; said control system including a plurality of stages corresponding to the respective different states required of the mechanism, said stages having set and reset conditions; control unit means for setting a selected stage only when said selected stage is next in operational sequence to a stage already in a set condition and for initiating a corresponding change of state of said mechanism; means interconnecting the stages of said control system for enabling the resetting of a previously set stage in response to the setting of a stage next in operational sequence to said previously set stage; means coupled to the mechanism for producing an indication of the state of the mechanism; means for continuously comparing said indication of the state of the mechanism with the control system stage which is set and for

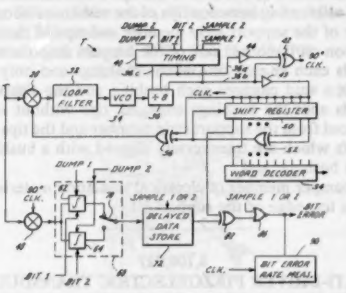


inhibiting the operation of the control unit means in the event of non-correspondence.

4,100,531
BIT ERROR RATE MEASUREMENT ABOVE AND BELOW BIT RATE TRACKING THRESHOLD

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Herbert S. Kobayashi, Webster; Joe Fowler, Pearland, both of Tex., and William Kurple, Phoenix, Ariz.

Filed Feb. 3, 1977, Ser. No. 765,167
Int. Cl.[2] G08C 25/00
U.S. Cl. 340—146.1 E **12 Claims**



1. An apparatus for testing the bit error rate of communication equipment, comprising:

a. means for forming and applying a test digital code signal simulating data to the equipment being tested, said means including means forming a pseudo-random bit sequence for said code signal;

b. means for receiving an incoming signal from the equipment in response to the test signal;

c. tracking means for tracking the incoming signal;

d. means responsive to said tracking means for forming a reproduction of the test digital code signal;

e. comparator means for comparing the reproduction with the incoming signal to detect bit errors in the equipment being tested, said tracking means including

i. means for deriving a clock signal from the incoming signal;

ii. means connected to and responsive to said clock signal

deriving means and to said means for forming a reproduction to produce a split phase pseudo-random noise tracking signal; and

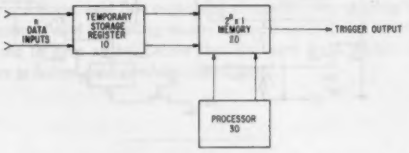
iii. means for multiplying the incoming signal with said tracking signal to form an error signal, said clock signal deriving means comprising means for deriving a clock signal in phase quadrature with the incoming signal from the incoming signal.

4,100,532

DIGITAL PATTERN TRIGGERING CIRCUIT

William A. Farnbach, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 19, 1976, Ser. No. 743,188
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 MA **12 Claims**



1. A range detector for operation upon a digital signal represented by a combination of bytes, the detector comprising:

first and second memory means, said first and second memory means coupled to receive a byte corresponding to the most significant bits and the next most significant bits of the digital signal respectively, each means having a loading input, a trigger output, an enable output, and two sets of storage elements, each element capable of storing a first or second value, each memory means applying signals to the trigger output and the enable output representative of the values of storage elements selected from the first and second sets respectively in response to the byte received at the input thereof;

coupling means having a first input coupled to receive the enable output of said first memory means, a second input coupled to receive the trigger output of said second memory means and a trigger output for producing an output signal upon detection of signals representative of the first value upon both inputs;

output means with a first input coupled to receive the trigger output of said first memory means, a second input coupled to receive the trigger output of said coupling means, and a trigger output for generating an output signal upon the detection of an input signal representative of the first value upon an input; and

means coupled to the loading inputs of said first and second memory means for storing selected values into selected storage elements.

4,100,533

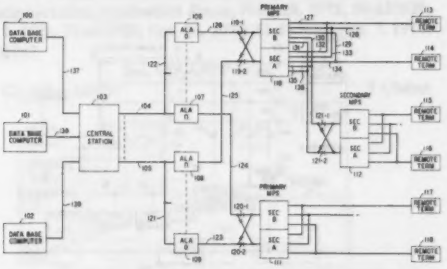
MULTIPOINT POLLING TECHNIQUE

Orlando Napolitano, Millstone Township, Monmouth County; Robert Edward Reid, Bricktown; Burton R. Saltzberg, Middletown; Nathan Harold Stochel, Edison, and John Ronald Tingley, Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1976, Ser. No. 747,700
Int. Cl.[2] H04Q *5/00*; H04J *3/04*
U.S. Cl. 340—147 R **19 Claims**

1. A multipoint polling system, comprising a plurality of remote terminals and a central station, the central station including means for providing a list of remote terminal addresses, the list of remote terminal addresses defining selective ones of the remote terminals to be polled via a signaling path extended from the central station to the remote terminals, the list of remote terminal addresses being divided into predefined portions, each portion comprising a plurality of remote terminal addresses, each address in the list appearing in at least one of the portions, characterized in that the polling system further includes:

means for storing one of the portions of the list of remote terminal addresses and for transmitting individual ones of the stored remote terminal addresses to the signaling path, and



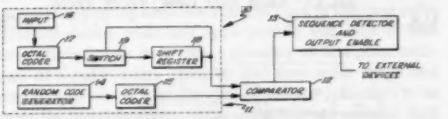
means for periodically requesting a different one of the portions of the list of remote terminal addresses from the providing means and for replacing the stored portion of remote terminal addresses with the requested portion of remote terminal addresses, whereby different subsets of remote terminals defined by the different address list portions are polled.

4,100,534

ELECTRONIC SECURITY SYSTEM

Glynne W. Shifflet, Jr., Minneapolis, Minn., assignor to Tuthill Corporation, Oak Brook, Ill.

Filed Dec. 9, 1976, Ser. No. 748,690
Int. Cl.[2] H04Q *3/00*; G06K *7/06*
U.S. Cl. 340—149 A **34 Claims**



1. In a device for obtaining limited access to a plurality of functions in response to the external entry of preselected code sequences of the type having means for entering a code sequence and means for selectively enabling said functions in response to said entered code sequences, the improvement which comprises:

means for sequentially generating a plurality of preselected code sequences, each having a higher rank than all prior generated code sequences;

means for individually comparing said generated code sequences with an entered code sequence to establish their degree of coincidence therewith; and

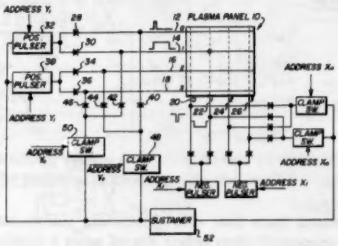
means responsive to said comparing means for enabling said functions on the occurrance of a preselected degree of coincidence between a generated code sequence and an entered code sequence in predetermined correspondence with rank of a generated code sequence having said preselected degree of coincidence with said entered code sequence.

4,100,535

METHOD AND APPARATUS FOR ADDRESSING AND SUSTAINING GAS DISCHARGE PANELS

Donald L. Bitzer, and Paul T. Tucker, both of Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Nov. 2, 1976, Ser. No. 738,066
Int. Cl.[2] G06F *3/14;* H01J *17/48;* H05B *37/00*
U.S. Cl. 340—166 R 15 Claims



1. Apparatus for addressing selected electrodes in an array of electrodes respectively associated with a particular location on a gas discharge panel, said apparatus comprising:

pulse means coupled to a group of said electrodes to charge said group of electrodes to a voltage magnitude sufficient to select a location on said panel;

said pulse means providing a pulse signal having an amplitude substantially equal to said voltage magnitude and a time duration insufficient to select a location on said panel; and

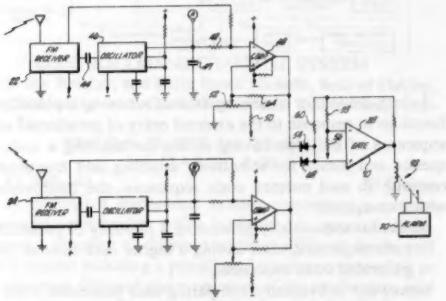
time selection means coupled to said group of electrodes for subsequently timely discharging said voltage magnitude on all except one electrode in said group of electrodes so that only said one electrode has an applied pulse signal amplitude and time duration sufficient to enable selection of a location associated with said one electrode.

4,100,536

BIO-ALARM SECURITY SYSTEM

Thomas S. Ball, 1637 Butternut Way, Diamond Bar, Calif. 91711, and John D. Rugh, Claremont, Calif., assignors to Thomas S. Ball, Diamond Bar, Calif.

Filed Oct. 7, 1976, Ser. No. 730,376
Int. Cl.[2] A61B *5/02;* G08C *19/26, 19/36*
U.S. Cl. 340—207 R 9 Claims



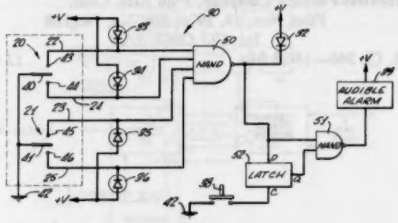
1. An alarm system comprising: an alarm; means carried by at least two individuals for detecting the state of psychological arousal in said individuals and emitting separate first signals of varying intensity corresponding to said states of arousal; means for transmitting said signals; means for receiving said signals; means for comparing each of said first signals with predetermined signals, each of said predetermined signals being proportional to the normal state of arousal of the individual from which said first signal was emitted; means for activating said alarm in a predetermined response to the totality of such comparisons.

4,100,537

MONITOR FOR GAS PIPING SYSTEM

Peter B. Carlson, Orange, Calif., assignor to Taylor Medical Oxygen Services, Inc., Orange, Calif.

Filed Aug. 8, 1977, Ser. No. 822,927
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—626 5 Claims



1. Apparatus for monitoring the pressure in a gas line and providing a visual and audible indication of a high or low pressure condition, said gas line having a pressure sensor for generating high and low pressure signals, comprising:

a high pressure visual indicator responsive to said high presure signal for providing a high pressure visual indication;

a low pressure visual indicator responsive to said low pressure signal for providing a low pressure visual indication;

a system normal visual indicator;

means for normally maintaining said system normal visual indicator in an "on" condition;

an audible alarm;

means responsive to either of said high or low pressure signals for turning "off" said system normal visual indicator and for activating said audible alarm; and

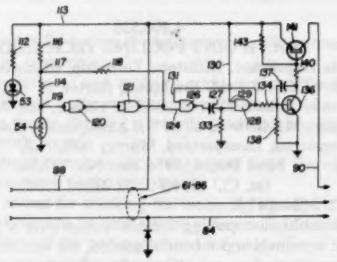
manual means for deactivating said audible alarm.

4,100,538

SEED LEVEL SENSOR FOR AUTOMATIC SEED PLANTING APPARATUS

John T. Knepler, Chatham, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Continuation-in-part of Ser. No. 525,581, Nov. 20, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,515
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—617 14 Claims



1. A monitor for interconnection with seed planting apparatus having seed dispensing means including a hopper for containing seeds, seed sensing means associated with said dispens-

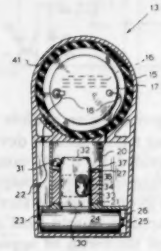
ing means, and indicator means interconnected with said seed sensing means through electrical lead means for indicating a malfunction of the seed dispensing means, said monitor comprising: first switch means connectible in series in said lead means between said seed sensing means and said indicator means for providing a first switching state during one instance and a second switching state during another instance, seed level sensing means for mounting within the hopper of said seed dispensing means, said seed level sensing means including signal means for producing a first signal condition when the level of seeds within the hopper is above a predetermined level and for producing a second signal condition when the level of seeds within the hopper is below said predetermined level, and circuit means coupled between said seed level sensing means and said first switch means for causing said first switch means to be in said first switching state during said first signal condition and in said second switching state during said second signal condition, said first switching means thereby causing the operation of said indicating means when in said second switching state to give an indication that the seed level within the hopper is below said predetermined level.

4,100,539

BURGLAR ALARM FOR DOOR KNOB

Oliver B. Stahl, Satellite Bch., and Harlund L. Byron, Ocoee, both of Fla., assignors to Marine Resources, Inc., Fern Park, Fla.

Filed Jan. 31, 1977, Ser. No. 764,401
Int. Cl.[2] G08B *13/08*
U.S. Cl. 340—546 **13 Claims**



1. An alarm appartus comprising in combination:

a housing having a receptacle formed therein, the receptacle being sized to fit over a door knob, or the like, and being at least partially lined with a resilient material disposed for engaging a door knob to permit movement of said housing with the rotation of a door knob that said housing is attached to;

electrical circuit means disposed in said housing and including operatively connected battery means, annunciator means, and switch means, said switch means including an electrical conductor platform, a movable electrical conductor switching member, and an electrical conducting wall, whereby movement of said housing allows said movable electrical conductor switching member to fall from said platform between said platform and conducting wall to complete a circuit and actuate said annunciator; and

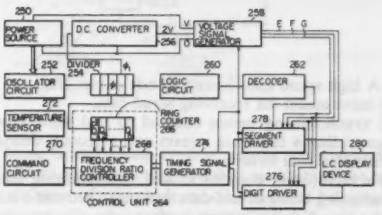
a reset knob located adjacent said housing for resetting an actuated alarm switch means by sliding a reset member to position said movable electrical conductor switching member upon said conductor platform.

4,100,540

METHOD OF DRIVING LIQUID CRYSTAL MATRIX DISPLAY DEVICE TO OBTAIN MAXIMUM CONTRAST AND REDUCE POWER CONSUMPTION

Hiroo Fujita, Sayama; Akira Tsuzuki, Tokyo, and Shigeru Morokawa, Higashiyamato, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1976, Ser. No. 742,971
Claims priority, application Japan, Nov. 18, 1975, 50-137839; May 7, 1976, 51-051789; Sep. 25, 1976, 51-115055; Sep. 7, 1976, 51-106917
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—324 M **5 Claims**

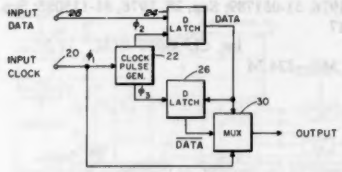


1. In a method of driving a display device comprising a matrix of display elements in an array including a plurality of digit electrodes and a plurality of segment electrodes, in which the display device comprises a liquid crystal having an intrinsic threshold voltage and an intrinsic saturation voltage and is operative at a predetermined operating margin, and in which digit drive signals are applied to said digit electrodes and segment drive signals are applied to said segment electrodes in timed relationship to said application of said digit drive signals, the improvement characterized in that each of the digit drive signals comprises a plurality of first pulse components of a first pulse width and varying at a plurality of voltage potentials during each one cycle period and a plurality of second pulse components of a second pulse width, each of said second pulse components appearing between adjacent ones of said first pulse components during each half cycle period, and each of said segment drive signals comprises a plurality of first pulse components of a pulse width equal to said first pulse width and varying at least two of said plurality of voltage potentials to be effective for providing a potential difference across said digit and segment electrodes to select a light transparent or a light scattering state of said and a plurality of second pulse components of a pulse width equal to said second pulse width and each appearing between adjacent ones of the first pulse components of each of said segment drive signals during said each half cycle period, wherein the second pulse components of said digit drive signals and said segment drive signals are in phase with each other and have the same voltage potential as that corresponding to one of said plurality of voltage potentials during said each half cycle period so that all of said digit electrodes and said segment electrodes are concurrently applied with the same voltage to zero the potential difference across said digit and segment electrodes during said each half cycle period for a predetermined time interval defined by said second pulse width whereby the root-mean-square values of voltages across said digit electrodes and said segment electrodes for the light transparent and light scattering states are close to said intrinsic threshold voltage and said intrinsic saturation voltage of said liquid crystal without changing said operating margin.

4,100,541
HIGH SPEED MANCHESTER ENCODER

Harris A. Quesnell, Jr., San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 26, 1976, Ser. No. 708,779
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD **8 Claims**

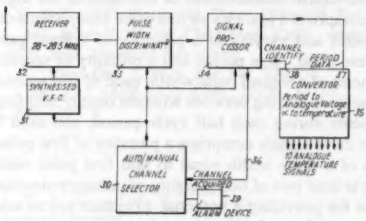


1. A high speed manchester encode comprising:
(a) input means for receiving serial data,
(b) synchronizing means coupled to said input means for providing a first data stream and a second delayed and inverted data stream,
(c) a multiplexer coupled to said synchronizing means for selecting either of said data streams to provide a manchester encoded data stream output.

4,100,542
MEASURING SYSTEM

John Henry Gallant, Upminster, and Michael Robert Thomas Johnson, South Ockendon, both of England, assignors to May & Baker Limited, England

Division of Ser. No. 429,692, Dec. 28, 1973, Pat. No. 3,953,803. This application Jan. 7, 1976, Ser. No. 647,156
Claims priority, application United Kingdom, Jan. 2, 1973, 00218/73
Int. Cl.[2] H04Q *3/00*
U.S. Cl. 340—518 **8 Claims**

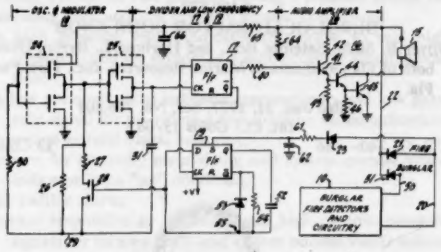


8. A measuring system for transmitting and receiving data from a plurality of sampling points comprising
a transmitter for each of said sampling points, each of said transmitters having a transducer for detecting variations in the value of a physical parameter being measured, the value of said physical parameter pulse modulating the output signal from said transmitter, and
a receiving system for receiving the pulse modulated signals from each of said transmitters, said receiving system including
a pulse width discriminator for receiving said pulse modulated signals and generating an output signal only when the time difference between successive pulse modulated signals is within a predetermined limit,
a channel selector having an output coupled to said pulse width discriminator for selecting the sample point to be interrogated, and
a signal processor having an output coupled to the output of said channel selector, said signal processor including
a first counter for storing a next following signal representative of the instantaneous value of the parameter being measured,
a second counter for storing the previous signal representative of the instantaneous value of said parameter, said previous signal being a reference signal,
comparison means for comparing said reference signal with said next following signal,
means for up-dating said second counter by entering said next following signal held in said first counter into said second counter, said next following signal being the next reference signal, and
a clock pulse generator coupled to said first and second counters and to said channel selector, said generator supplying clock pulses to both of said counters in response to a signal from said channel selector.

4,100,543
AUDIBLE ALARM APPARATUS PARTICULARLY ADAPTABLE FOR USE WITH FIRE AND THEFT SECURITY SYSTEMS

Roy Stockdale, Huntington, and Lance Weston, Babylon, both of N.Y., assignors to Napco Security Systems, Inc., Copiaque, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,539
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—521 **10 Claims**



1. A circuit for providing an audible alarm at a given frequency by energizing a loud speaker device at said frequency, said frequency provided by a RC controlled oscillator for providing a signal frequency at an output and having an undesireable variation in duty cycle to thereby result in a reduction in the power applied to said loud speaker, the improvement in combination therewith of apparatus for providing a fifty percent duty cycle to said loud speaker, comprising:
(a) a triggerable frequency divider coupled to said oscillator output and operative to divide said signal frequency by a factor of $2n$, where n is a positive integer, said divider operative to provide a divided signal having a fifty percent duty cycle substantially independent of the frequency and duty cycle of said oscillator, and
(b) means for applying said divided signal to said loud speaker device.

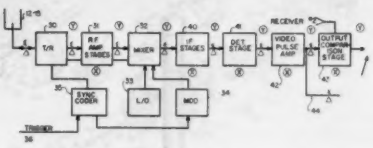
4,100,544
BEACON SYSTEM EMPLOYING RAMPED GAIN RECEIVER

Royal V. Keeran, Upland, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Jul. 25, 1977, Ser. No. 818,376
Int. Cl.[2] G01S *3/32, 9/22*
U.S. Cl. 343—6.5 R **6 Claims**

1. In an interrogator-transponder system including a transmitting and receiving antenna system,
a pulse transmitter;
a pulse receiver;
transmit-receive switch for selectively connecting the an-

tenna system to the transmitter and the pulse receiver in which the pulse receiver responds to return pulses from a transponder on a remote vehicle which transponder reacts to interrogator pulses from the pulse transmitter in which the antenna system includes a plurality of antennas from which the sum and difference components of the receive signals from the transponder are derived and in which the



receiver processes the sum Σ and difference Δ signals in part and in two different channels and in which the receiver includes means for comparing the level of the sum Σ channel with respect to the difference Δ channel;

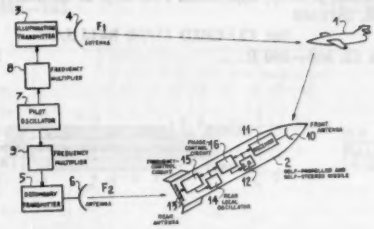
the improvement comprising means for simultaneously varying the gain of the receiver sum Σ signal channel inversely with respect to the receiver difference Δ signal channel.

4,100,545

MISSILE GUIDANCE SYSTEM

Rémy Tabourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 22, 1976, Ser. No. 725,495
Claims priority, application France, Sep. 24, 1975, 75 29266
Int. Cl.² G01S 9/02; F41G 7/00
U.S. Cl. 343—7 ED **6 Claims**



1. In a guidance system for a self-propelled and self-steered missile provided with a rear antenna and a front antenna, in combination:

a radar station including a pilot oscillator, a first illuminating transmitter coupled to a first antenna and to said pilot oscillator through a first frequency-multiplying circuit to produce a target-illuminating signal at a first frequency F_1, and a second illuminating transmitter coupled to a second antenna and to said pilot oscillator through a second frequency-multiplying circuit to produce a rear reference continuous-wave signal for the missile at a frequency F_2 different from F_1;

a receiver aboard said missile coupled to said front antenna, a front local oscillator connected to said receiver, a rear local oscillator phase-controlled by the continuous wave received by the rear antenna, and phase-control means comprising a frequency multiplier for controlling the frequency and the phase of said front local oscillator by said rear local oscillator; and

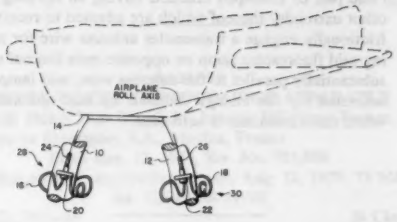
flight-control means aboard said missile connected to said receiver for directing the missile toward the target.

4,100,546

AIRBORNE ANTENNA SYSTEM EMPLOYING THE AIRFRAME AS AN ANTENNA

Donn V. Campbell, Eatontown, N.J., and Edward J. Paragi, New Haven, Ind., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 28, 1977, Ser. No. 763,440
Int. Cl.² H01Q 1/28
U.S. Cl. 343—708 **5 Claims**



1. A phase front homing airplane antenna array comprising:

a pair of spaced substantially vertical members of the metallic airframe of said airplane, said members being spaced symmetrically about the longitudinal roll axis of said airplane;

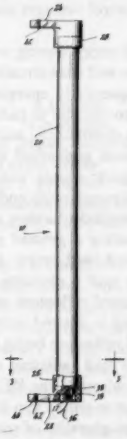
a pair of like toroidal coils surrounding and electromagnetically coupled to respective portions of said vertical members and positioned symmetrically about said axis, the combination of each of said coils and associated vertical member comprising one of a pair of symmetrical antennas of said array, each coil having a pair of radio frequency feed terminals, and a pair of symmetrical transmission lines connected between respective pairs of said feed terminals and said airplane.

4,100,547

FLUORESCENT TUBE INDICATOR MOUNTED ON ANTENNA

P. Richard Cooke, Yonkers, N.Y., assignor to Midnight Ears, Inc., White Plains, N.Y.

Filed May 26, 1976, Ser. No. 690,251
Int. Cl.² H01Q 1/06
U.S. Cl. 343—721 **5 Claims**



1. A transmitter antenna attachment for attaching a fluores-

cent lamp on the antenna of a transmitter which lights when said transmitter is activated, comprising in combination

(a) a fluorescent lamp, and

(b) a pair of L-shaped brackets of insulating material having hollow sockets on one extremity thereof adapted when the hollow sockets are positioned facing each other to receive and frictionally engage the ends of said fluorescent lamp for mounting said fluorescent lamp therein between said brackets,

(c) said pair of L-shaped brackets having an opening in the other extremity thereof which are adapted to receive and frictionally engage a transmitter antenna wire for mounting said fluorescent lamp on opposite ends thereof on and substantially parallel to the antenna wire, said lamp being activated by the energy radiated by said antenna wire when the transmitter is activated.

4,100,548

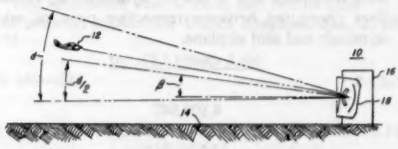
BIFOCAL PILLBOX ANTENNA SYSTEM

Christian Otto Hemmi, Dallas; Oren Byrl Kesler, Richardson, and Richard Thomas Dover, Dallas, all of Tex., assignors to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Sep. 30, 1976, Ser. No. 728,086

Int. Cl.[2] H01Q *3/26*

U.S. Cl. 343—837 **14 Claims**



1. An antenna system comprising:

(a) a controller means for forming control voltages and sequential switching signals;

(b) a plurality of scan circuits connected to said controller means for producing RF energy power level outputs in response to said control voltages and sequential switching signals;

(c) a contoured feed array having a plurality of feed elements connected to said scan circuits, said plurality of feed elements being sequentially energized in response to the outputs of said scan circuits to radiate RF energy having a non-linear phase distribution; and

(d) a waveguide means connected to said contoured feed array, said waveguide means comprising a plurality of spaced interleaved panels with ends staggered to provide a continuous waveguide having a plurality of stacked portions and including a ground plane bar mounted behind said contoured feed array, a waveguide having a radiating aperture and a plurality of selectively shaped reflectors, said shaped reflectors providing a plurality of focal points having a desired spacing, said plurality of selectively shaped reflectors being mounted in said waveguide intermediate said radiating aperture and said contoured feed array whereby the RF energy radiating from selected feed elements with a non-linear phase distribution is channeled to said plurality of selectively shaped reflectors having said plurality of focal points and reflected with a substantially linear phase distribution and transmitted.

4,100,549

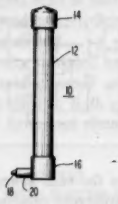
DISPOSABLE MARKER

James R. Hubbard, Moorestown, N.J., assignor to Graphic Controls Corporation, Cherry Hill, N.J.

Continuation-in-part of Ser. No. 554,521, Mar. 3, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 654,406

Int. Cl.[2] G01D *15/16*; B67D *3/00*; B43K *5/00*

U.S. Cl. 346—140 A **11 Claims**



1. A disposable instrument marker pen with self-contained ink supply comprised of an elongated plastic-sheathed fibrous ink reservoir material, an end cap on one end thereof, a tip cap on the opposite end thereof, both of said caps sealingly engaged thereon, said tip cap including a capillary nib extending therefrom, said plastic-sheathed fibrous ink reservoir material being cut at said tip cap end thereof, so that said ink reservoir material will contain an outer end surface area, said capillary nib and said ink reservoir material being adapted to mate at said surface area.

4,100,550

LIQUID JET RECORDER

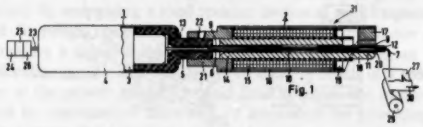
Rune Elmqvist, Bromma, and Bertil Almgren, Vallingby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 11, 1977, Ser. No. 776,768

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2619369

Int. Cl.[2] G01D *15/18*; B41J *3/04*

U.S. Cl. 346—140 R **10 Claims**



1. In a liquid jet recorder having a capillary tube, a permanent magnet, an electromagnet, said electromagnet comprising a core and a winding, said capillary tube having one end connected to a filter which is connected to a liquid pump, the other end of the capillary tube being bent to form a nozzle to direct a recording jet onto a recording carrier, said permanent magnet being carried on the capillary tube and arranged in an air gap of the electromagnet, the improvement comprising the core of the electromagnet comprising an inner tube with the winding arranged thereon, said inner tube coaxially surrounding the capillary tube with the winding being coaxial with the capillary tube.

4,100,551

ROTARY ELECTRICAL PRINTER AND METHOD

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

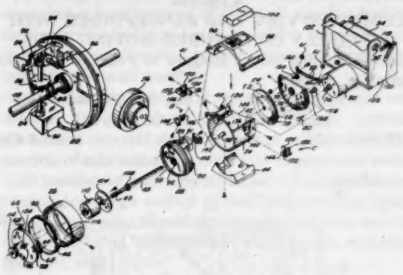
Filed Sep. 9, 1975, Ser. No. 611,785

Int. Cl.[2] G03G *17/00*

U.S. Cl. 346—162 **19 Claims**

1. In a rotary electrical printer including a rotor, means for rotating said rotor, at least one group of styli on said rotor, feed

means for moving a recording sheet past said rotor substantially continuously in a direction transverse to the direction of rotation of said rotor with said styli contacting said sheet, said group including a plurality of axially-spaced styli, and electrical control means for selectively energizing said styli to cause



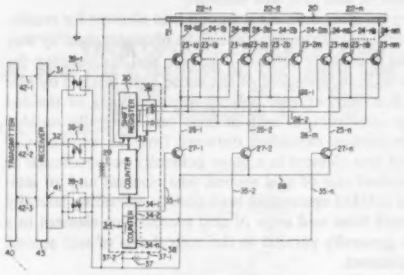
each stylus to form a dot on said sheet at a selected location and thereby form images from transverse rows and circumferential columns of such dots, the styli in said group being positioned closely adjacent to one another so as to form a group of contiguous columns during a single pass of said styli over said recording sheet.

4,100,552

RECORDING APPARATUS FOR A VOLTAGE SENSITIVE RECORDING SYSTEM

Hakaru Muto, Kamakura; Sadasuke Kurabayashi, Kawasaki; Yasushi Takatori, Machida; Isao Yamaguchi, Tokyo, and Asao Watanabe, Higashi Kurume, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1976, Ser. No. 711,208
Claims priority, application Japan, Aug. 7, 1975, 50-96206
Int. Cl.[2] G03G *17/00*
U.S. Cl. 346—162 **16 Claims**



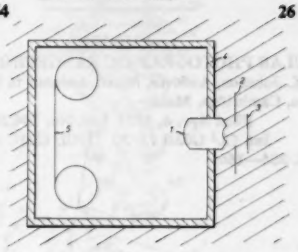
1. A recording apparatus comprising:
a recording medium;
recording means disposed in proximity to said recording medium for effecting recording on said recording medium by application of a voltage thereto;
a first switching element having two switching terminals and a control terminal, one of said switching terminals being connected to said recording means;
a second switching element having two switching terminals and a control terminal, one of said switching terminals being connected to the other switching terminal of said first switching element, and said second switching element having a lower withstanding voltage requirement than that of said first switching element;
recording signal generating means for generating recording signal voltages to be applied to the control terminals of said first and second switching elements;
a first power source connected to the other switching terminal of said second switching element, the voltage of said first power source being sufficient to effect recording on said recording medium by being applied thereto; and
a second power source connected between the other switching terminal of said second switching element and said recording signal generating means, the voltage of said second power source being used to provide the said recording signal voltages applied from said recording signal generating means to the control terminals of said first and second switching elements.

4,100,553

UNDER-WATER PHOTOGRAPHIC APPARATUS

Francois Henri Paul Danel, St. Martin D'Uriage, France, assignor to Formaplex S.A., Meylan, France

Filed Aug. 12, 1976, Ser. No. 713,836
Claims priority, application France, Aug. 22, 1975, 75 26348
Int. Cl.[2] G03B *11/08*
U.S. Cl. 354—64 **26 Claims**



1. A photographic apparatus of the kind comprising a watertight casing which forms internally a dark chamber, a lens which closes towards the front of said dark chamber, a diaphragm adapted to regulate the aperture of said lens, a shutter adapted alternately to cover and uncover said lens, said shutter having a set position wherein said shutter covers said lens and is ready to be actuated to momentarily uncover said lens, a re-setting lever intended to put said shutter in the set position, and a release push-rod for liberating said shutter, in which said diaphragm is arranged in front of the said lens, on the outside of the said casing, so that when the apparatus is immersed in water, said lens and diaphragm are in direct contact with the water.

4,100,554

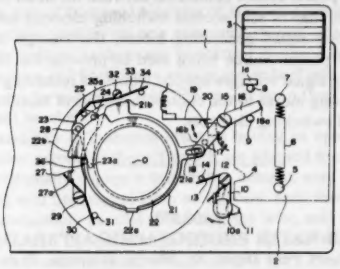
CAMERA

Yaichi Iijima, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1975, Ser. No. 602,916
Claims priority, application Japan, Aug. 13, 1974, 49-97026
Int. Cl.[2] G03B *15/05*
U.S. Cl. 354—145 **3 Claims**

1. In a camera having a housing, an objective lens, an adjustable diaphragm, focusing means, and an automatic exposure controlling device, the combination of means selectively controlling said adjustable diaphragm by said focusing means or by said automatic exposure controlling device, an electronic flash, means movably mounting said electronic flash on said housing from a first position relative to the optical axis of said objective lens to a second position located at a sufficiently greater distance relative to the optical axis of said objective lens to prevent the red-eye phenomenon during the electronic flash operation, and means controlled by movement of said

electronic flash mounting means to its second position for operating said selectively controlling means to transfer control



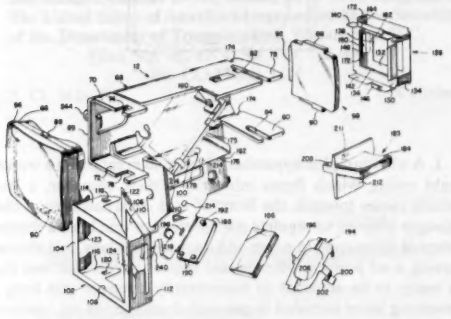
of said adjustable diaphragm from said automatic exposure controlling device to said focusing means.

4,100,555

MODULAR PHOTOGRAPHIC RANGEFINDER CAMERA

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1977, Ser. No. 784,245
Int. Cl.[2] G03B *13/20, 13/02;* G01C *3/04*
U.S. Cl. 354—166 **37 Claims**



35. A camera of the rangefinder type comprising:

a variable focus objective lens;

a camera housing having portions structured to be normally held in a horizontal plane during a photographic exposure cycle, said camera housing including a front wall portion having a first aperture for accommodating the admission of scene light to said objective lens, a second aperture spaced apart from said first aperture and a third aperture spaced apart from said second aperture along a line which intersects said second aperture and is oblique to the horizontal plane when said camera is held in its said normal position; and

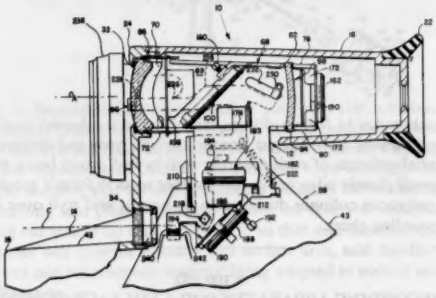
a combined viewing and rangefinding means for imaging scene light received through said second aperture to provide a first image in a field of view generally corresponding to the field of view for said objective lens, and for imaging scene light received through said third aperture to provide a second image in a portion of said field of view, said imaged scene light received through said third aperture being superposed on said imaged scene light received through said second aperture so that said first and second images may be viewable together from a position outside of said camera housing, said combined view and rangefinding means additionally including means for facilitating movement of said second image across said first image along said oblique line when said camera is held in its said normal position, said second image moving in correspondence to camera focusing so that said second image is moved into substantial coincidence with said first image in correspondence to said objective lens assuming a focused condition with respect to the scene to be photographed.

4,100,556

COMBINED VIEW AND RANGEFINDER WITH SPECIALLY CONFIGURED MOVING LENS

Igor Blinow, Millis, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1977, Ser. No. 784,246
Int. Cl.[2] G03B *13/20;* G01C *3/04*
U.S. Cl. 354—166 **5 Claims**



1. A combined view and rangefinder for use in cameras having a variable focus objective lens comprising:

a first lens element for receiving scene light from a scene to be photographed and imaging the scene light so received in a field of view generally corresponding to the field of view for the objective lens of the camera;

an eye lens;

a specularly reflective surface for receiving scene light independent of said first lens element;

a unitary member defining a second lens element for receiving scene light from the scene to be photographed by way of said specularly reflective surface and for imaging the scene light independent of the scene light imaged by said first lens element, said unitary member being of molded plastic construction with at least one integrally molded flange portion extending outward from an edge of said second lens element in a plane generally perpendicular to the optical axis of said second lens element and an integrally molded upstanding wall portion extending laterally outward from said edge of said second lens element in a plane generally parallel to the optical axis of said second lens element;

means for splitting a light beam;

support means for stationing said first lens element, said light beam splitting means and said eye lens in spaced apart alignment so that said first lens element receives and transmits scene light from the scene to be photographed toward said beam splitting means which in turn transmits such scene light toward said eye lens to facilitate viewing of imaged scene light, said support means additionally supporting said unitary member and its said second lens element for limited displacement about a determinate path while also supporting said specularly reflective surface in spaced apart optical alignment with respect to said second lens element on the opposite side of said second lens element from said beam splitting means, said specularly reflective surface operating to angularly deflect scene light to said second lens element whereby scene light received and transmitted to said second lens element is ultimately directed toward said beam splitting means so as to be deflected by said beam splitting means toward said eye lens to accommodate viewing through said eye lens of said

scene light imaged by said second lens element, said support means comprising at least one wall member having a longitudinal slot therein through which said flange portion of said unitary member is slidingly inserted for limited reciprocal translation about said determinate path, said upstanding wall portion of said unitary member slidingly engaging at least portions of said wall member during said limited reciprocal translation to inhibit lateral movement in at least one direction of said unitary member with respect to said wall member;

spring means connecting said flange portion of said unitary member for resiliently biasing said flange portion for movement into said slot so as to urge said upstanding wall portion of said unitary member into engagement with said wall member of said support means while simultaneously biasing one major surface of said flange portion against a longitudinal edge of said slot so as to facilitate said reciprocal translation without said flange portion wobbling in said slot; and

means for facilitating movement of said unitary member and its second lens element across said determinate path in correspondence to camera focusing so that said second image is moved into substantial coincidence with said first image in correspondence to the objective lens of the camera assuming a focused condition with respect to the scene to be photographed.

4,100,557

VISOR OPTICAL CAMERA SYSTEM

Duc Doan, 7814 S. San Pedro St., Los Angeles, Calif. 90003

Filed May 12, 1977, Ser. No. 796,128
Int. Cl.[2] G03B *13/08*; A42C *5/00*
U.S. Cl. 354—225 **5 Claims**

1. A visor optical system for sighting a remotely located camera comprising:

a camera having a vertically oriented viewing screen disposed below eye level of an individual holding the camera, and

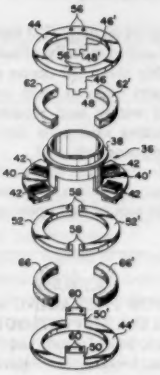
a visor mirror supported substantially at eye level and oriented for viewing the camera viewing screen when looking straight ahead so that said camera can be aimed and shot by an individual in directions other than in which the individual is apparently looking.

4,100,558

AUTOMATIC-EXPOSURE CONTROL DEVICE FOR OPTICAL INSTRUMENTS

Hiroshi Koike, No. 5-10, 1-chome, Minami-Azabu, Minato-ku, Tokyo; Shoji Suzuki, No. 11-4-208, 4-chome, Minami-Dai, Sagamihara City, Kanagawa Prefecture, and Takeki Asakawa, No. 3-2, 2-chome, Minami-Azabu, Minato-ku, Tokyo, all of Japan

Division of Ser. No. 396,207, Sep. 11, 1973, Pat. No. 3,971,963.
This application Oct. 17, 1975, Ser. No. 623,541
Claims priority, application Japan, Sep. 14, 1972, 47-92386
Int. Cl.[2] G03B *9/02*
U.S. Cl. 354—271 **7 Claims**



1. A diaphragm-assisted exposure control device, comprising

A. a stationary inner support member (22), constructed from a non-magnetic material, which is formed with a circular opening having a center axis therethrough;

B. a plurality of diaphragm blades (24) which are arranged substantially symmetrically about said center axis and are rotatable about respective axes which are substantially parallel with said center axis, whereby said diaphragm blades are capable of forming therebetween a variable-area aperture having an area which is optimum for the brightness detected by a control signal generating means and having a center axis substantially in line with the center axis of said opening, each said diaphagm blade having a cam slot therein;

C. a stator unit concentrically positioned externally of said inner support member and comprising:

(1) first and second annular outer pole pieces (44 and 44'), disposed so as to be axially spaced apart from and parallel with each other, said pole pieces having identical radii of curvature and inner pole surfaces in axially opposed relationship,

(2) first and second semi-circular permanent magnets (62 and 66, 62' and 66'), having:

(a) outer magnet surfaces which are attached to said inner pole surfaces, and

(b) first and second inner magnet surfaces which are axially spaced apart in opposed relationship and said identical radii of curvature, and

(3) an intermediate pole piece (52, 52') which:

(a) is disposed approximately between and in parallel to said first and second pairs of permanent magnets, and

(b) is spaced sufficiently far apart from said inner magnet surfaces so as to form first and second air gaps therebetween so that a magnetic field is established across said air gaps and like field poles appear at said inner magnet surfaces and opposite like field poles appear at said outer magnet surfaces, in said first and second outer pole pieces, and in said intermediate pole piece,

D. a stationary outer support member (70), constructed from a non-magnetic material, which holds said stator unit in position concentrically and externally of said inner support member;

E. a rotor unit, comprising;

(1) a bored non-magnetic cylinder (36) having a flange (40, 40') extending radially outwardly from one circumferential edge thereof and an opening formed in said flange, and

(2) an armature (42, 42') mounted in said flange within said opening and having the coil thereof wound so that portions extend axially and radially to define an arcuately disposed opening which is located on one side of said flange;

F. a rotatable support member (72) supporting said rotor unit concentrically and externally of said inner support member and rotatably about the center axis of said opening in the inner support member, said intermediate pole piece being disposed within said arcuately disposed opening without contacting said coils throughout the range of rotation of said rotor unit; and

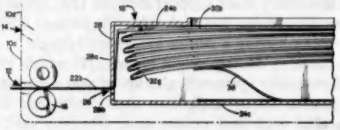
G. pins (80) projecting from said rotatable support member respectively into said cam slots substantially in parallel with said center axis of said opening in said inner support member.

4,100,559

APPARATUS FOR PACKAGING AND FOR USING SELF-DEVELOPING PHOTOGRAPHIC FILM

Richard R. Wareham, Marblehead, and Nicholas Gold, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,266
Int. Cl.[2] G03B *17/26*
U.S. Cl. 354—277 **12 Claims**



1. A self-developing photographic film cassette comprising:

a plurality of self-developing photographic film units each having an image area of given length intermediate a leading and trailing edge and arranged in sequential stacked relation from first forwardmost to last with respect to each other;

leader means for at least interconnecting the trailing edge of each film unit to the leading edge of the immediately succeeding film unit in said stack;

housing means for holding said stacked film units, said housing means having a forward generally planar wall member adjacent said forwardmost film unit with an exposure window therethrough of substantially the same length as said given length, said housing means additionally including wall means defining an elongated film discharge slot in generally parallel spaced apart relation with respect to the leading edge of the forwardmost of said film units, said wall means including a backward generally planar wall member spaced apart from said forward wall member in generally parallel relation thereto with said stack of film units being disposed between said forward and backward walls, said wall means additionally including peripheral side walls interconnecting said forward and backward walls with that one of said sidewalls most closely spaced from said leading edges of said film units defining said discharge slot, said discharge slot also being more closely spaced to said backward wall member than said forward wall member;

removable light shield means for shielding the forwardmost of said film units from actinic radiation attempting to enter said cassette through its said exposure window;

resilient means for yieldably urging said stacked film units toward said exposure window to move each successive film unit in order of first to last into the forwardmost position adjacent said exposure window upon the withdrawal of each preceding film unit through said discharge slot; and

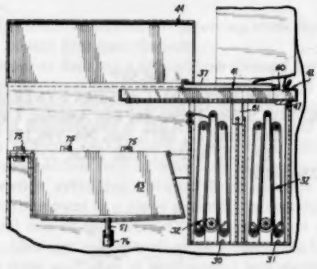
means for facilitating the withdrawal of said first forwardmost film unit from said discharge slot in said housing means, said wall means being configured to engage the leading edge of each successive film unit in the forwardmost position just as said image area of that film unit is pulled into registration with said exposure window by that portion of said leader means connected directly to the leading edge thereof, with further pulling of said respective leader portion increasing the tension thereof and causing the leading edge of the pulled film unit to assume deflecting engagement with said wall means to effect the advancement of the pulled film unit towards and through said discharge slot, each of said successive engagements between said wall means and a respective film unit, in order of second to last, serving to substantially increase the tension at that portion of the leader means being pulled so as to signify that the next succeeding film unit is in the forwardmost position with its image area in registration with said exposure window.

4,100,560

MULTI-PURPOSE MODIFICATION FOR LITHOGRAPHIC PLATE-MAKER

Frank E. Schochet, 4820 Highway 7, Minneapolis, Minn. 55416

Filed Apr. 22, 1976, Ser. No. 679,511
Int. Cl.[2] G03D *17/00, 13/02*
U.S. Cl. 354—307 **1 Claim**



1. In an automatic photolithographic machine in which an exposed photolithographic medium is normally transferred automatically from a magazine through an actinically closed chamber including a succession of containers for activating and fixing solutions, to an actinicially unshielded manual access discharge location, the improvement which comprises:

first container means at least partially enclosed in said chamber and removably interposed between the magazine and the containers to prevent normal passage of the medium to said containers and to receive the medium in a first chemical bath in manually accessible fashion;

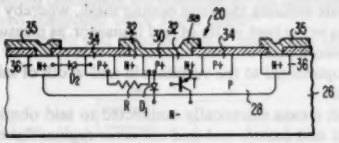
second container means removably positioned in said discharge location for receiving the medium in a second chemical bath when manually transferred from said first container means; and

means mounted on said machine over said discharge location and the portion of said first container means not enclosed in said chamber, to prevent actinic light from reaching said first container means, while affording manual access to both said container means.

4,100,561
PROTECTIVE CIRCUIT FOR MOS DEVICES

Joel Ollendorf, West Orange, N.J., assignor to RCA Corp., New York, N.Y.

Filed May 24, 1976, Ser. No. 689,269
Int. Cl.[2] H01L 29/90, 29/78
U.S. Cl. 357—13 5 Claims

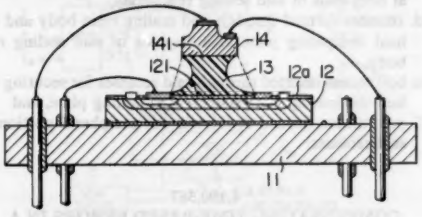


1. A device comprising:
(a) a semiconductor substrate of a first conductivity type;
(b) a well region of opposite conductivity type to said substrate extending into said substrate from a surface thereof;
(c) a first region extending into said well region from a surface thereof, said first region being of the same conductivity type as said substrate;
(d) a second region of the same conductivity type as said first region, said second region extending into both said well region and said substrate, said second region being more highly doped than said substrate;
(e) first means for making electrical contact to said second region, said first means thereby making electrical contact to said second region and to said substrate; and
(f) second means for simultaneously contacting said first region and said well region, the portion of said well region contacted by said second means being isolated from said second region by said first region, said second means including a third region of the same conductivity type as said well region but having a higher doping concentration, said third region being surrounded by said first region.

4,100,562
LIGHT COUPLED SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Yoshitaka Sugawara; Tsutomu Yatsuo, and Nobutake Konishi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 19, 1976, Ser. No. 678,171
Claims priority, application Japan, Apr. 30, 1975, 50-52390
Int. Cl.[2] H01L 31/12
U.S. Cl. 357—19 17 Claims



1. A light coupled semiconductor device comprising:
a light emitting semiconductor element having a surface with at least a part of said surface providing a light emitting area,
a light sensing semiconductor element having a surface with at least a part of said surface providing a light sensing area, said light sensing area facing said light emitting area, and
a light guide made of a single member of light transmissible material and having two opposite end surfaces, one of which is held in wet contact with the light emitting area and the other of which is held in wet contact with said light sensing area so as to not substantially extend beyond said light sensing area.

4,100,563
SEMICONDUCTOR MAGNETIC TRANSDUCERS

Lowell E. Clark, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

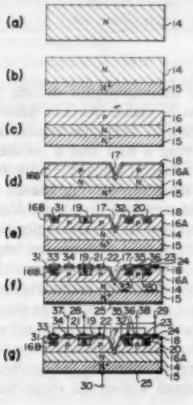
Continuation of Ser. No. 726,891, Sep. 27, 1976, which is a continuation of Ser. No. 537,145, Dec. 30, 1974, abandoned. This application Nov. 14, 1977, Ser. No. 851,225
Int. Cl.[2] H01L 27/22, 29/82, 29/96
U.S. Cl. 357—27 9 Claims

1. A semiconductor device for sensing a magnetic field, comprising:
a first major region of a first conductivity type and having a major surface and two contact means for providing current along a path therebetween;
second, third and fourth regions of second conductivity type in p-n junction relation with and mutually isolated by said first region at said surface, said second, third and fourth regions lying along a straight line perpendicular to a straight line connecting said contact means, one of said second, third and fourth regions lying on said straight line connecting said contact means; and
a fifth region of said second conductivity type in p-n junction relation with and completely surrounding said first region at said surface.

4,100,564
POWER TRANSISTOR DEVICE

Takao Sasayama, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Division of Ser. No. 668,433, Mar. 19, 1976, abandoned. This application Dec. 15, 1976, Ser. No. 750,587
Claims priority, application Japan, Apr. 4, 1975, 50-40270
Int. Cl.[2] H01L 27/02
U.S. Cl. 357—46 4 Claims



1. A power transistor device comprising:
an N-type substrate having two main surfaces;
an N^+-type layer formed in one of said two main surfaces of said N-type substrate;
a first and a second P-type layer formed in the other main

surface of said N-type substrate, said first and second P-type layers being electrically isolated from each other;

a first and a second N-type layer formed respectively in said first and second P-type layers, said first N-type layer acting as an emitter for said first P-type layer and said N-type substrate, said second N-type layer acting as an emitter for said second P-type layer as well as said N-type substrate, respectively;

a third N-type layer formed in said first P-type layer, said third N-type layer acting as a collector for said first N-type layer and being spaced apart from said first N-type layer by a portion of said first P-type layer between said first and third N-type layers;

means for electrically connecting said first P-type layer to said third N-type layer;

a fourth N-type layer formed in said second P-type layer and being non-contiguous with said second N-type layer by a predetermined portion of said second P-type layer between said fourth and second N-type layers; and

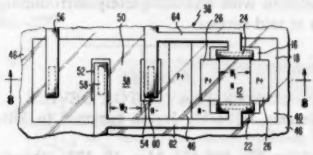
means for electrically connecting said first N-type layer, said second P-type layer, and said fourth N-type layer to each other.

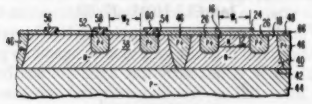
4,100,565

MONOLITHIC RESISTOR FOR COMPENSATING BETA OF A LATERAL TRANSISTOR

Heshmat Khajezadeh, Somerville, and Stephen Carl Ahrens, Delran, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 656,295, Feb. 9, 1976, Pat. No. 4,057,894.
This application Aug. 25, 1977, Ser. No. 827,569
Int. Cl.² H01L *27/02*
U.S. Cl. 357—51 **3 Claims**





1. In a monolithic semiconductor device having a resistor disposed adjacent to a planar surface thereof, said resistor including a first region of one type conductivity adjacent to said surface and having a first and a second ohmic contact thereto, and having a lateral transistor adjacent to said planar surface, said lateral transistor having spaced emitter and collector regions of said opposite type conductivity adjacent to said surface and disposed in a base region of said one type conductivity adjacent to said surface, the improvement comprising:

said first region continuously extending between said first and second ohmic contacts and being disposed in a second region of said one type conductivity adjacent said surface, said second region having a lower impurity concentration than said first region, whereby the conductive path of said resistor is contained within the more-heavily-doped first region,

means for controllably establishing the value of said resistor comprising two additional regions of the opposite type conductivity disposed respectively on opposite sides of said conductive path adjacent to both said surface and the junction between said first and said second regions, said additional regions having a higher impurity concentration and a greater depth than said first region and extending into said first region, whereby the width of said resistor, as measured along the perpendicular to said conductive path at various locations along said conductive path, is defined by the extent of said additional regions into said first region, said additional regions having been formed simultaneously with said emitter and said collector regions while utilizing the same doping mask, whereby any variation in the base width of said transistor, as measured by the distance between said emitter and said collector regions, is proportional to the variation in said width of said resistor, and

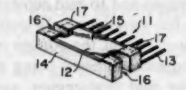
circuit means electrically connected to said ohmic contacts and said emitter and said collector regions for connecting said resistor with said transistor to compensate for a variation in the base width of said transistor.

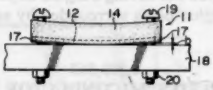
4,100,566

RESIN-SEALED TYPE SEMICONDUCTOR DEVICES AND MANUFACTURING METHOD OF THE SAME

Susumu Okikawa, Ohme, and Hiroshi Mikino, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 23, 1977, Ser. No. 780,327
Claims priority, application Japan, Mar. 24, 1976, 51-31249; Mar. 24, 1976, 51-31250; May 28, 1976, 51-61171
Int. Cl.² H01L *23/48, 29/44, 29/52*
U.S. Cl. 357—70 **16 Claims**





1. A semiconductor device, comprising:

a. a sealing resin body,

b. a heat dissipating plate provided on the lower surface of said resin body and having a smaller thermal expansion coefficient that that of said resin body,

c. a mounting plate for mounting said heat dissipating plate at both ends of said sealing resin body,

d. recesses formed through said sealing resin body and said heat dissipating plate at both ends of said sealing resin body,

e. bolt means inserted through said recesses for securing said heat dissipating plate onto said mounting plate, and

f. protrusions formed at least in the peripheral portions of said recesses.

4,100,567

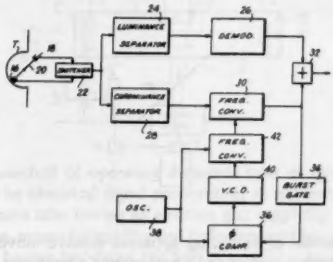
COMPENSATING TIME-BASED ERRORS IN A REPRODUCED VIDEO SIGNAL

Tadaaki Yoshinaka, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

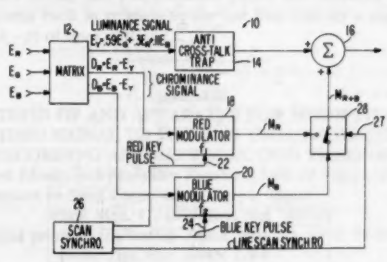
Filed Mar. 14, 1977, Ser. No. 777,542
Claims priority, application Japan, Mar. 17, 1976, 51-28991
Int. Cl.² H04N *5/79*
U.S. Cl. 358—8 **10 Claims**

1. Apparatus for compensating time-base errors introduced into a composite color video signal reproduced by a video signal playback system, the composite color video signal including luminance and chrominance components and a horizontal synchronizing signal, said apparatus comprising:

means for receiving said composite color video signal from said video signal playback system;
separating means for separating said luminance and chrominance components from said received composite color video signal;
means for detecting time-base errors in said received composite color video signal;
local oscillator means for generating a local subcarrier reference signal containing the time-base errors detected in said received composite color video signal;
means coupled to said local oscillator means and said separating means for substituting said subcarrier reference signal for the reproduced subcarrier of said chrominance component;
delay means for imparting a time delay to at least said luminance component, said time delay being equal to one horizontal line interval of said composite color video signal; and
combining means coupled to said separating means and to said substituting means for combining said delayed luminance component and the substituted-subcarrier chrominance component into a reformed composite color video signal.

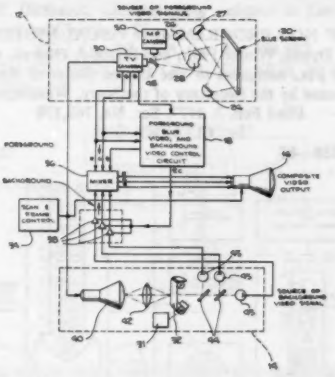


4,100,568
COLOR TELEVISION ENCODER SIGNALS
Donald D. Kline, Palo Alto, Calif., assignor to Commercial Electronics, Inc., Mountain View, Calif.
Filed May 5, 1976, Ser. No. 683,347
Int. Cl.[2] H04N 9/02
U.S. Cl. 358—21 **22 Claims**



1. A chrominance modulation system for generating a composite time-multiplexed chrominance signal of a color television encoder comprising:
a first modulator means for modulating a first chrominance signal during first time periods;
a second modulator means for modulating a second chrominance signal during second time periods;
a first oscillator providing a first reference signal at a first subcarrier frequency;
a second oscillator providing a second reference signal at a second subcarrier frequency differing from said first subcarrier frequency;
means coupled to said first modulator means and to said second modulator means for alternately switching said first and second chrominance signals to generate a common time-multiplexed composite chrominance signal;
means for phase synchronizing said first modulator with said first reference signal during said second time period; and
means for phase synchronizing said second modulator with said second reference signal during said first time periods.

4,100,569
COMPREHENSIVE ELECTRONIC COMPOSITING SYSTEM
Petro Vlahos, 4111 Van Alden, Tarzana, Calif. 91356
Continuation-in-part of Ser. No. 738,740, Nov. 8, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,097
Int. Cl.[2] H04N 9/535
U.S. Cl. 358—22 **27 Claims**



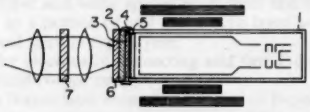
1. A comprehensive electronic compositing system of the single color screen type where said single color is a first one of the primary colors, comprising:
a source of color foreground video signals, including at least signals representing red, green and blue;
a source of background video signals;
means for developing a clamping voltage having an instantaneous value equal to a function of the instantaneous value of a second one of said colors plus a function of the difference of the smaller of said two remaining colors subtracted from the larger of said two remaining colors;
means for developing a background control voltage having a value which is a function of the difference between the value of said first foreground video color less a function of the second and third foreground colors;
means for limiting the value of the foreground video signal of said first color in accordance with said clamping voltage;
means for controlling the levels of the background video signals in accordance with the value of said background control voltage; and
means for combining the foreground and background video signals as modified to produce composite foreground and background video signals representing a composite picture.

4,100,570

OPTICAL IMAGE PICKUP SYSTEM

Saburo Nobutoki, Mobara, and Yukio Okano, Osaka, both of Japan, assignors to Hitachi, Ltd. and Minolta Camera Co., Ltd., both of, Japan

Filed Feb. 24, 1976, Ser. No. 660,781
Claims priority, application Japan, Mar. 12, 1975, 50-28977
Int. Cl.[2] H04N 9/07
U.S. Cl. 358—44 14 Claims



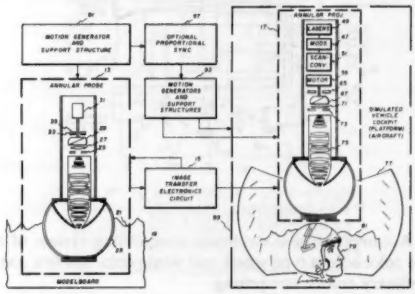
1. An optical image pickup system having an optical transfer function including a stripe-shaped color separation filter, comprising at least one double refraction plate and at least one diffraction grating spatial frequency filter arranged serially in an optical image pickup path, thereby reducing the optical transfer function of said optical image pickup system in at least the chromaticity band spatial frequency range.

4,100,571

360° NON-PROGRAMMED VISUAL SYSTEM

Wiley V. Dykes, Winter Park, and Frank J. Oharek, Orlando, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1977, Ser. No. 765,170
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—87 25 Claims



23. A method for displaying a miniature model scene as a life-size replica thereof, comprising the steps of:

probing said miniature model scene and forming an annular optical image thereof;

rotating said annular optical image of said probed miniature model scene at a predetermined speed and in a predetermined direction;

scanning the rotated annular optical image of said probed miniature model scene in such manner as to generate a plurality of electrical signals representative thereof;

reconstructing the scanned rotated annular optical image of said miniature model scene from said plurality of electrical signals;

rotating said reconstructed scanned rotated annular optical image of said miniature model scene at a speed and in a direction that is equal and opposite to that of the previous rotation of the aforesaid annular optical image of said probed miniature model scene; and

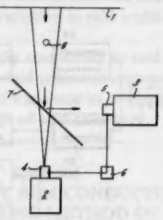
projecting said rotated reconstructed optical image of said miniature model scene onto a predetermined viewing screen so as to display a life-size replica thereof.

4,100,572

OPTICAL METHOD AND APPARATUS FOR CARRYING OUT THE METHOD

Zoran Perisic, "Gwynfenton",, White Well, St. Teath, Nr. Bodmin, Cornwall, England

Filed Oct. 15, 1976, Ser. No. 732,603
Claims priority, application United Kingdom, Oct. 17, 1975, 42788/75
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—93 17 Claims



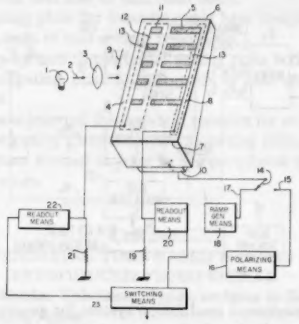
1. A method of providing apparent relative movement in depth between a subject and a background comprising projecting a background onto a reflective surface, placing a subject to which movement is to be imparted in the optical path between the background and a viewer, and providing the viewer with a zoom capability synchronised with zoom conditions imparted to the background such that on the background zooming the viewer zooms to the same degree so that there is no apparent alteration in the background seen by the viewer whereas the subject which is only affected by the zoom capability of the viewer, appears to move relative in depth to the background.

4,100,573

THERMAL IMAGING TRANSDUCER AND SYSTEM

J. Louis Berger, 8614 Camden St., Alexandria, Va. 22308

Filed Sep. 20, 1976, Ser. No. 724,487
Int. Cl.[2] H04N 5/33
U.S. Cl. 358—113 7 Claims



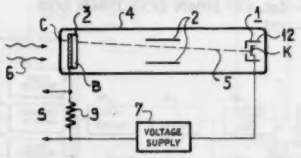
1. A thermal imaging transducer system comprising a segmented wedge of ferroelectric material responsive to infrared radiation, means for polarizing said wedge using a descending voltage, means to electrically read a signal out of said wedge using an ascending voltage of a polarity the opposite of said descending voltage, such that the system will be responsive to a thermal image.

4,100,574

METHOD FOR ELECTRICALLY READING A RESISTIVE TARGET IN A CAMERA TUBE

Pierre Félix, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 1, 1977, Ser. No. 764,650
Claims priority, application France, Feb. 6, 1976, 76 03332
Int. Cl.[2] H04N 5/33
U.S. Cl. 358—113 6 Claims



1. A method of operating a camera tube of the type that supplies an electrical signal proportional to incident radiation, said camera tube having an electron gun supplying a beam of electrons, means for guiding and deflecting said beam, towards a target having two faces, the first of said faces receiving said incident radiation and converting it into a spatial distribution of electrical charges, and means for establishing a potential difference between said gun and said target, said method for electrically reading said target, comprising the repetition of a sequence of three phases:

(a). a phase for reading said distribution of charges by means of said electron beam which scans the second face of said target in a succession of N parallel lines forming a raster;

(b) a compensation phase, during which the impact of said electron beam on said target gives rise to a secondary electron emission which positively polarises said second face of the target;

(c) a levelling phase during which the impact of said electron beam on said second face of the target results in the homogenisation of said positive polarisation and during which the beam of electrons goes back in relation to the last line read by a number k of lines, with $k<N$;

the duration of the reading phase being substantially equal to the duration of a line scanning and the duration of each of the levelling and compensation phases being similar; relative to the duration of the raster, to that of a reading phase; and during said compensation phase, said electron beam going back in relation to the last line read by a number $(k-p)$ of lines with $p<k$.

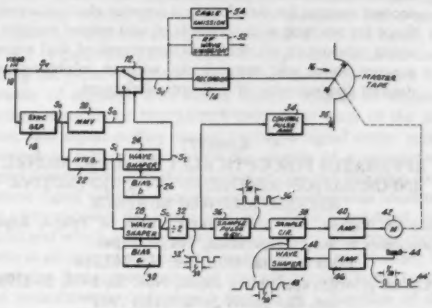
4,100,575

METHOD OF AND APPARATUS FOR MODIFYING A VIDEO SIGNAL TO PREVENT UNAUTHORIZED RECORDING AND REPRODUCTION THEREOF

Minoru Morio, and Masahiro Kambara, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 17, 1977, Ser. No. 778,709
Claims priority, application Japan, Mar. 22, 1976, 51-31108
Int. Cl.[2] H04N 1/44
U.S. Cl. 358—120 20 Claims

11. Apparatus for processing a video signal, comprising: receiving means for receiving the video signal, said video signal including a vertical blanking interval during which a set of equalizing pulses followed by a set of vertical synchronizing pulses followed by another set of equalizing pulses are transmitted; generating means for generating simulated equalizing pulses having the same amplitude level and waveshape as said equalizing pulses included in said vertical blanking interval; substituting means for substituting said simulated equalizing pulses for at least some of said vertical synchronizing pulses and said other set of equalizing pulses in said received video signal; and output means to which said received video signal,



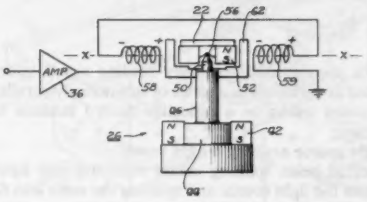
including said substituted simulated equalizing pulses, are supplied.

4,100,576

ELECTROMAGNETIC OPTICAL BEAM CONTROLLER HAVING AN EDDY CURRENT DAMPER FOR ARRESTING MECHANICAL RESONANCE

Alfred R. Ditthardt, Glenview, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 28, 1976, Ser. No. 681,092
Int. Cl.[2] H04N 5/76; G11B 7/08; G02B 27/17
U.S. Cl. 358—128 2 Claims



1. In an optical image-reproducing system in which program information stored in a generally spiral track is retrieved by scanning the track with a beam of optical energy and in which is derived a pair of correction signals related to the radial tracking and to the timing of said beam relative to said track, an improved beam control apparatus comprising:

a first ring-shaped, axially poled magnet;

a second axially-poled magnet having a pivot bearing associated therewith and poled in the same direction as said first magnet;

support means comprising a pin cooperating with said bearing for pivotally positioning said second magnet coaxially with and in such proximity to said first magnet that said second magnet is magnetically captivated upon said pin but free for tilting displacement with respect to a pair of orthogonally related axes;

an optical element positioned so that said beam is incident thereon and mechanically coupled to said second magnet for concurrent displacement therewith to redirect the path of said beam;

electromagnetic means positioned along an assigned one of said axes in close proximity to said second magnet and responsive to one of said correction signals to develop a magnetic field, having a magnitude and direction determined by the amplitude and polarity of said applied correction signal, for reacting with the field of said second magnet to effect a desired displacement of said optical element about the other one of said axes; and

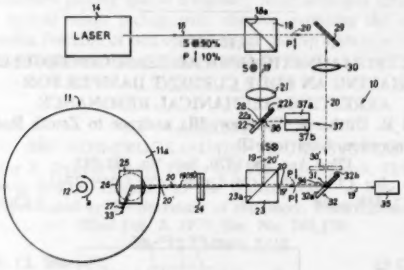
damping means comprising a conductive member disposed adjacent to and completely surrounding said second magnet and responsive to the magnetic flux of the field of said second magnet for developing a counter electromagnetic force for reacting with said field of said second magnet to arrest random or uncontrolled movement of said second magnet about said support pin without inhibiting said desired displacement of said optical element.

4,100,577

APPARATUS FOR OPTICALLY READING SIGNAL INFORMATION RECORDED ON A REFLECTIVE RECORD MEDIUM SURFACE

Yohsuke Naruse, and Mikio Sugiki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 18, 1976, Ser. No. 743,010
Claims priority, application Japan, Nov. 20, 1975, 50-139525
Int. Cl.[2] H04N *5/76;* **G11B** *7/12*
U.S. Cl. 358—128 **5 Claims**



1. An apparatus for optically reading signal information recorded as variations in a series of substantially parallel, adjacent record tracks on a reflective record medium surface, comprising

a light source emitting a light beam;

polarized beam splitting means receiving said light beam from the light source and splitting the same into first and second polarized light beams which are respectively polarized in first and second polarization directions;

means defining a first optical path in which said first polarized light beam is projected against said record medium surface with a relatively small landing spot on the latter embracing only one of said record tracks and reflected from the record medium surface so as to be modulated by the variations in said one track;

means responsive to energy from the modulated first polarized light beam as reflected from said record medium surface for developing an output signal representing the information signal recorded as variations in said one record track on the record medium surface;

means defining a second optical path spaced from said first optical path and in which said second polarized light beam is projected against said record medium surface with a relatively large landing spot on the latter which spans a plurality of said record tracks so as to be reflected from said record medium surface while avoiding modulation of the reflected second polarized light beam by said variations in each of said record tracks;

objective lens means interposed in said first and second optical paths and being movable toward and away from said record medium surface for varying the focus of said first polarized light beam at said record medium surface and for varying the refraction of the reflected second polarized light beam by said objective lens means, respectively; and

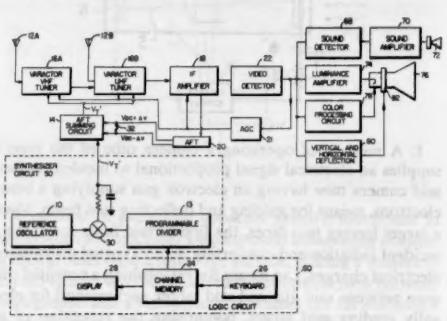
focus-servo means including detecting means receiving the reflected second polarized light beam as refracted by said objective lens means for providing a control signal which varies with said refraction, and means responsive to said control signal for moving said objective lens means in the sense to maintain proper focus of said first polarized light beam at said record medium surface.

4,100,578

AFT SUMMING CIRCUIT FOR VARACTOR-TYPE TUNING SYSTEMS

Blayne E. Arneson, Evergreen Park, Ill., assignor to Admiral Corporation, Schaumburg, Ill.

Filed May 3, 1977, Ser. No. 793,364
Int. Cl.[2] H04N *5/50;* **H04B** *1/16*
U.S. Cl. 358—191 **16 Claims**



1. In a receiver having tuner means for selectively detecting and processing a transmitted signal, an AFT circuit for providing a correction signal, and channel selection means for providing a tuning signal whose amplitude is indicative of the channel to be tuned by said tuning means, an AFT summing circuit comprising:

amplifier means having first and second inputs for receiving, respectively, the correction signal and the tuning signal, for providing a composite output signal, to be applied to said tuning means and having a tuning signal component and a correction component, said amplifier means including first means for providing a substantially predetermined gain to the tuning signal component, and second means for varying the correction signal component of the composite output signal.

4,100,579

AC OPERATED FLAT PANEL LIQUID CRYSTAL DISPLAY

Michael N. Ernstoff, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 509,376, Sep. 24, 1974, abandoned. This application Nov. 29, 1976, Ser. No. 745,722
Int. Cl.[2] H04N *5/66;* **G02F** *1/18, 9/32, 1/16*
U.S. Cl. 358—230 **6 Claims**

1. A liquid crystal display system responsive to a video display signal having a frame rate comprising:

a transparent coverplate having a first electrode structure comprising a multiplicity of electrically independent transparent conductive stripes formed as elements on one of its surfaces;

a second electrode structure formed on a semiconductor wafer having a plurality of elements;

a layer of liquid crystal material sandwiched between said first electrode structure and said second electrode structure;

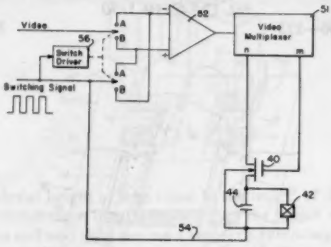
an insulating spacer providing electrical insulation and physical spacing between said first electrode structure and said second electrode structure;

sealing means for providing retention of said liquid crystal material between said transparent cover plate and said semiconductor wafer;

means for inversion of an applied video signal at a periodic rate equal to the frame rate of a video display signal, thus providing an inverted and a non-inverted video signal at alternate frames;

means for maintaining the polarity of the inverted video signal the same as the polarity of the non-inverted video signal;

means for the sequential application and removal of a constant value of potential to each of said multiplicity of



electrically independent transparent conductive stripes at a periodic rate equal to the frame rate of said video display signal; and

addressing means for applying said inverted and said non-inverted video signals, alternately received from the means for inversion, to said second electrode structure whereby the direction of current flow between elements of said first electrode structure and said second electrode structure is reversed at a periodic rate equal to the frame rate of the video display signal.

4,100,580

FACSIMILE SYSTEM

Hermanus Hubertus Hendrikus Groothuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

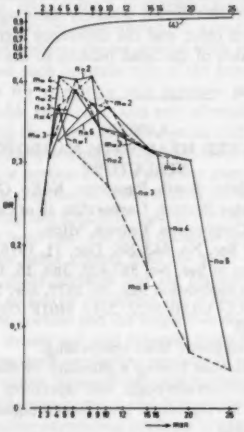
Continuation of Ser. No. 470,797, May 17, 1974, abandoned.

This application Feb. 19, 1976, Ser. No. 659,428

Claims priority, application Netherlands, Jun. 1, 1973, 7307630

Int. Cl.[2] **H04N** *1/40, 7/12*

U.S. Cl. 358—260 **21 Claims**



1. A facsimile transmission system comprising a picture pick-up device means for converting line by line, through lines comprising picture elements, picture information to be transmitted into a picture signal, a picture signal coding circuit having a picture element comparison circuit means for deriving a coded signal from picture signal values associated with adjacent picture information, the signal coded circuit having a clock pulse source means for control purposes and a store means coupled to said clock for storage of the coded signal, the picture element comparison circuit comprising means for comparing the picture element signal values associated with a first number of adjacent lines and a second number of adjacent picture elements or one picture element of each of the said lines, said signal coding circuit having a signal coder means coupled to said coding circuit for supply of a comparison signal thereto which in the presence of one and the same fixed picture signal value in all compared picture elements constituting a group causes the coder to supply a determined fixed code signal and which in the absence of the same fixed picture signal value in all picture elements of the group releases the coder for supplying during processing of the said picture signal values and instantaneous code signal derived as a function of the occurrence of the different picture signal values in the respective compared picture elements of the group.

4,100,581

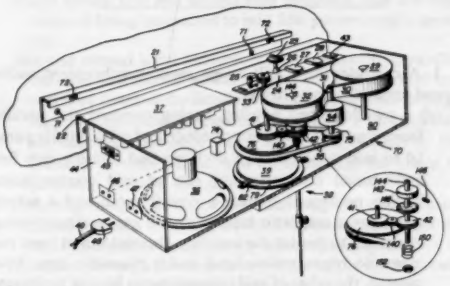
DOOR ACTUATED MESSAGE DEVICE

Donald J. Slack, 904 Orangewood Dr., Brea, Calif. 92621, and Jay D. Talley, 6352 San Harco Cir., Buena Park, Calif. 90620

Filed Sep. 30, 1976, Ser. No. 728,048

Int. Cl.[2] **G11B** *15/48;* **H01H** *3/16;* **G08B** *13/08*

U.S. Cl. 360—12 **8 Claims**



1. In combination, an improved actuation mechanism for actuating a message device capable of reproducing a recorded message on opening of a door, the message device having a housing with an aperture extending through one wall thereof, the improvement comprising:

a switch mounted on the message device;

circuit means for electrically connecting the switch to the message device, actuation of the switch actuating the message device;

an actuating arm member connected to the switch and extending therefrom, an inner end portion of the arm member being stationarily mounted to the switch, a distal end portion of the arm member being mounted to the outer end of said inner end portion for movement relative thereto;

a disc having a flange disposed perimetrically thereabout, a portion of the disc being rotatably received within the aperture in the wall of the housing, the flange being of a diameter greater than the aperture, surface portions of the flange abutting surface portions of the wall adjacent the aperature, the switch being mounted to the disc on a surface portion thereof extending externally of the housing through said aperture, the switch extending externally of the housing;

means for retaining the disc in the aperture for rotation therewithin, whereby the position of the switch can be adjusted relative to the housing on rotation of the disc; and,

means for adjusting the position of said distal end portion relative to said inner end portion of the arm member, the distal end portion of the arm member being positioned to contact a portion of the door as the door is opened, thereby to actuate the switch and thus the message device.

4,100,582

AUDIO-VISUAL APPARATUS

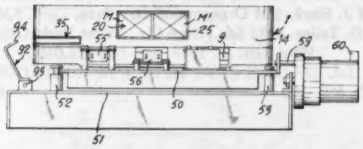
Nardino Righi, Milan, Italy, and Roberto Gavioli, 54, Corso di Porta Vittoria, Milan, Italy (20100), assignors to Eurafrica S.R.L. Societa' per Ricerche Elettroniche e Audiovisivi and Roberto Gavioli, both of Milan, Italy

Filed Nov. 29, 1976, Ser. No. 745,694

Claims priority, application Italy, Nov. 28, 1975, 29780 A/75; May 28, 1976, 23730 A/76

Int. Cl.² G03B *31/06, 31/04;* G11B *15/18*

U.S. Cl. 360—80 **3 Claims**



1. A cartridge for a still image sound-synchronized audio-visual apparatus comprising:

(a) a parallelepiped housing having opposed flat parallel faces, a partition wall intermediate and substantially parallel to said opposed faces dividing said housing into first and second compartments, one of said compartments having positioned therein a payoff spool and a takeup spool for a magnetic tape, said one compartment being apertured to permit the insertion thereinto of at least one magnetic reproduction head and a magnetic tape drive capstan, the other of said compartments having positioned therein a payoff spool and a takeup spool for a photographic film, said other compartment being apertured to permit projection of the images on the photographic film, the payoff and the takeup spools of the respective compartments being coaxially mounted and independently rotatable;

(b) a magnetic tape having sound information thereon wound upon the payoff and takeup spools of said one compartment;

(c) a photographic film having a plurality of frames with visual information thereon wound upon the payoff and takeup spools of said other compartment, and a series of spaced perforations provided along the length of said film; and

(d) means for controlling the movement of said film comprising a lever fulcrummed on said housing having the pivotal axis thereof parallel to the rotational axes of said spools, one end of said lever having means thereon cooperable with a perforation on one of said film frames for selectively arresting the movement thereof, said lever being pivotable by a force applied to the other end thereof so as to pivot between a first position in which said means on said one end of the lever is out of engagement with said film perforation to permit movement thereof and a second position in which said means on said one end of the lever engages with the film perforation to prevent movement thereof, spring means being provided for normally biasing said lever into said second position.

4,100,583

THIN-FILM MAGNETIC HEAD FOR READING AND WRITING INFORMATION

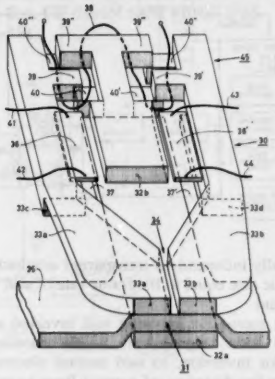
Gerrit J. Koel; Frederik W. Gorter, and Jan T. Gerkema, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 14, 1976, Ser. No. 705,050

Claims priority, application Netherlands, Jul. 17, 1975, 7508533

Int. Cl.² G11B *5/30*

U.S. Cl. 360—113 **2 Claims**



1. A thin-film magnetic head for reading information from and writing information in a track of an associated magnetic recording medium, comprising a magnetically permeable yoke, means coupled thereto for applying a writing current, and a magneto-resistive reading element bridging a gap between two parts of the yoke, said yoke having three limbs: a central limb located in a first plane, and two outer limbs located in a second plane and meeting each other at the area of the central limb while forming a writing/reading gap between the central limb and the outer limbs, an auxiliary gap being present between the outer limbs at the area of the center of the central limb, and that each outer limb, in a place spaced from the writing/reading gap, is separated from the central limb by a gap, said gaps being each bridged by a magneto-resistive element, said magneto-resistive elements cooperating with an associated electric circuit which includes means whereby their signals are subtracted from each other and the difference signal is used to control the position of the head relative to the center of the track.

4,100,584

TRANSDUCER HEAD WITH NARROW CORE STRUCTURE

Michael Isaac Behr, South Pasadena; KoKo Gyi, Thousand Oaks, and Werner Brutsch, Garberville, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 643,994, Dec. 11, 1975, abandoned, which is a division of Ser. No. 587,429, Jun. 16, 1975, Pat. No. 4,017,965. This application Sep. 26, 1977, Ser. No. 836,783

Int. Cl.² G11B *5/22, 5/42;* H01F *7/06*

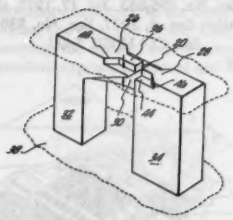
U.S. Cl. 360—125 **9 Claims**

1. A multiple magnetic head comprising:

a non-magnetic base having a plurality of elongated apertures formed therethrough, said apertures extending in parallel and having center lines spaced equidistantly from each other; and

a ferrite magnetic core member bonded in each one of said apertures and each including a core gap of 100μ inches or less extending in a plane normal to the center line of the apertures, said cores each having laser trepanned surface regions on both sides of the gap forming parallel slots,

across said core gap, said slots being spaced apart to define a narrow core portion therebetween having an effective core width within the range of 0.5 mil—1 mil and having

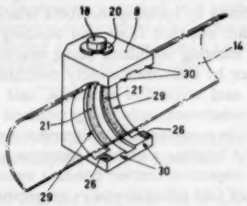


a throat height at least equal to the length of the gap, said slots having a length greater than the length of said core gap and said slots having a long axis extending in parallelism with the center lines of said apertures and having skewed longitudinal ends.

4,100,585
MAGNETIC-TAPE GUIDE ARRANGEMENT

Nanno Van Slageren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,348
Claims priority, application Netherlands, Feb. 4, 1976, 7601106
Int. Cl.[2] G11B *15/60*
U.S. Cl. 360—130 **2 Claims**



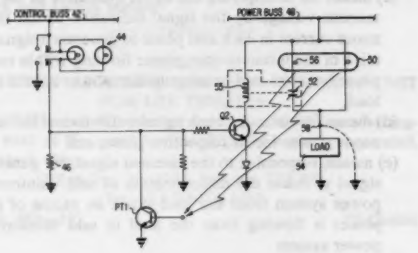
1. A magnetic tape guide arrangement for a transverse scan tape recorder, comprising a head disc rotatable about an axis parallel to a direction of movement of a magnetic tape; two at least partly cylindrical drums coaxial with said axis with one drum disposed each opposite side of the head disc; a pressure piece; means for mounting said pressure piece to be transversely movable relative to said axis of rotation; and resilient means pressing the pressure piece against said drums when said recorder is in an operating condition, each of the drums having a convex guide portion and the pressure piece having concave guide portions disposed to either side of the head disc contacting and guiding the magnetic tape in a locally cupped condition past said head disc, the axial distance between the convex guide portions being greater than the axial distance between the concave guide portions and the pressure piece being located so that an axially extending gap is formed between each concave guide portion and the respective nearer convex guide portion, said drums and said pressure piece having respective convex and concave supporting portions of substantially equal radius of curvature disposed adjacent to the edges of the magnetic tape, said pressure piece and drums contacting each other at said respective supporting portions in response to pressing by said resilient means,

wherein said concave supporting portions and said respective convex supporting portions are disposed axially to each side of the head disc at an axial distance from each other at least as great as the distance between the convex guide portion of one drum and the convex guide portion of the other drum.

4,100,586
TUNGSTEN LAMP CIRCUIT FOR CURRENT LIMITING AND FAULT INDICATION

Michael Joseph Cronin, Sherman Oaks, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 30, 1976, Ser. No. 755,657
Int. Cl.[2] H02H *3/16*
U.S. Cl. 361—58 **21 Claims**



1. A current limiting and fault indicating circuit comprising:

first and second power supply terminals;

a load having first and second load terminals, said first load terminal being connected to said first power supply terminal;

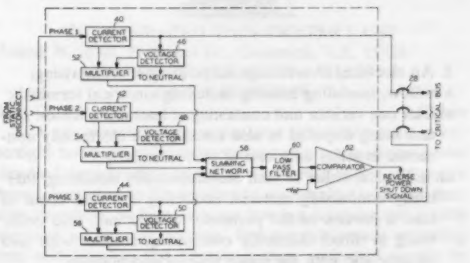
first and second lamp filament means connected in parallel between said second power supply terminal and said second load terminal for limiting the flow of current through said fault indicating circuit in the event of a short circuit, for indicating the occurrence of the short circuit by the emission of visible light, and for indicating the status of said lamp filament means; and

switching means for effectively removing one of said lamp filament means from the circuit in response to the occurrence of a short circuit thereby further limiting the flow of current through the circuit as a result of the short circuit.

4,100,587
CIRCUIT FOR DETECTING THE FLOW OF AN EXCESS OF REVERSE POWER FROM A LOAD TO A POWER SYSTEM

Thomas E. Anderson; Steven C. Peak, both of Normal, and Ole N. Ibsen, Bloomington, all of Ill., assignors to General Electric Company, New York, N.Y.

Filed Dec. 28, 1976, Ser. No. 755,102
Int. Cl.[2] H02H *3/42*
U.S. Cl. 361—82 **21 Claims**



1. In a multi-phase uninterruptible power system including a rectifier connected to an AC source, a battery, and an inverter connected to said rectifier and said battery for delivering mul-

ti-phase AC power to a critical load, a circuit disposed between said inverter and the critical load for detecting the flow of an excess of reverse power from the load to said uninterruptible power system is comprised of:

(a) means within each phase for generating a signal indicative of the instantaneous current flowing within each said phase between said uninterruptible power system and the load;

(b) means within each phase for generating a signal indicative of the instantaneous output voltage for each said phase of said uninterruptible power system;

(c) means for multiplying the signal indicative of the instantaneous voltage by the signal indicative of the instantaneous current in each said phase to generate a signal indicative of the instantaneous power flowing within each said phase between said uninterruptible power system and the load;

(d) means for summing each signal indicative of the instantaneous power for its respective phase; and

(e) means, responsive to the summed signal, for generating a signal to cause the disconnection of said uninterruptible power system from the load when an excess of reverse power is flowing from the load to said uninterruptible power system.

4,100,588

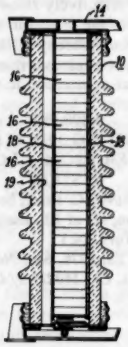
ELECTRICAL OVERVOLTAGE SURGE ARRESTER WITH VARISTOR HEAT TRANSFER AND SINKING MEANS

James S. Kresge, Pittsfield, Mass., assignor to General Electric Company, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,007

Int. Cl.[2] H02H *3/22*

U.S. Cl. 361—127 **22 Claims**



1. An electrical overvoltage surge arrester, comprising:

a hollow, insulating housing including electrical terminals;

at least one varistor unit containing at least one varistor, said unit being disposed in said housing and electrically connected in series with two of said terminals;

an individual collar of resilient, electrically insulating, thermally conducting material encircling the unit about at least a portion of the perimeter of said unit, said collar being in direct thermally conducting contact with said varistor and with the inside wall of said housing,

said collar including a venting portion which is spaced from said wall to define a venting passageway connecting portions of the interior of said housing to either end of said housing.

4,100,589

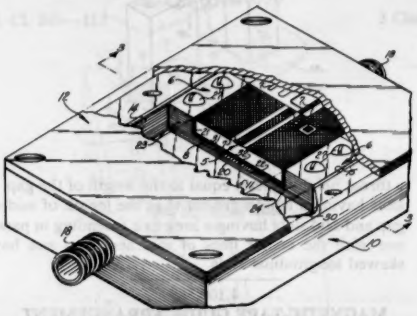
MICROCIRCUIT DEVICE INCLUDING HYBRID CIRCUIT CARRIER

William Edward McGann, Satellite Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 596,853, Jul. 17, 1975, abandoned. This application Sep. 6, 1977, Ser. No. 830,601

Int. Cl.[2] H05K *5/00*

U.S. Cl. 361—399 **7 Claims**



1. A microcircuit device comprised of: a plurality of substrates each having circuitry formed thereon and each of which must be placed in a certain predetermined alignment with respect to at least another of said substrates; a plurality of carriers each associated with a respective substrate and each having a bonding surface to which the respective substrate is to be secured, the boundaries of said bonding surfaces in each case being defined by locating members which are associated with and extend outward from said bonding surface of said carriers, said locating members being spaced apart on said bonding surface by a distance closely matching a longitudinal dimension of said respective substrate, said substrate being positioned therebetween, and closely received thereby so as to provide a certain predetermined alignment, established by the position of said locating members, between each of said substrates and its respective carrier; bonding material for securely bonding each of said substrates to its respective carrier in said predetermined alignment established by said locating members; a housing including a base for partially enclosing all of said carriers and their respective substrate and a cover which may be removably connected to the base to complete the enclosure of said carriers and substrates; and, securing means for removably securing each of said carriers to said base of said housing in preselected positions with respect to one another which have been selected so that the cooperative result of the alignment of said substrates with respect to said carriers and said carriers with respect to said housing is such as to provide the required alignment of said substrates with respect to one another, whereby each said substrate is properly aligned and is readily replaceable within said housing.

4,100,590

SCENE-BRIGHTNESS-DEPENDENT CONTROL OF FLASHBULB FLASH DURATION

Eduard Wagensonner, Aschheim, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Oct. 22, 1976, Ser. No. 734,988

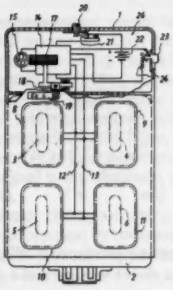
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1975, 7535234[U]

Int. Cl.[2] G03B *15/02*

U.S. Cl. 362—16 **9 Claims**

1. An arrangement for effecting scene-brightness-dependent control of the duration of the flash produced by a flashbulb flash unit having at least one flashbulb, the arrangement comprising, in combination, a housing so configured and dimen-

sioned that it can be pushed over and onto the flashbulb flash unit, the housing being provided with at least one controllable-transparency optical unit located to occupy the position in front of the at least one flashbulb of the flash unit when the housing has been pushed into place over the flash unit, and an automatic scene-brightness dependent flash-duration control circuit in the housing connected to the optical unit and operative for controlling the duration of the flash produced by the flashbulb by keeping the optical unit transparent for a scene-brightness-dependent exposure interval and then automatically



rendering the optical unit non-transparent, the flash-duration control circuit comprising a battery in the housing, a light sensor in the housing positioned to receive scene light, a light-measuring circuit in the housing and connected to the battery and to the light sensor and operative for generating a signal indicative of total scene light, and a threshold circuit in the housing and connected to the light-measuring circuit and to the controllable-transparency optical unit and operative for rendering the latter non-transparent when the signal generated by the light-measuring circuit has reached a value corresponding to a predetermined total of scene light.

4,100,591

ILLUMINATION UNIT FOR MICROFILM READERS

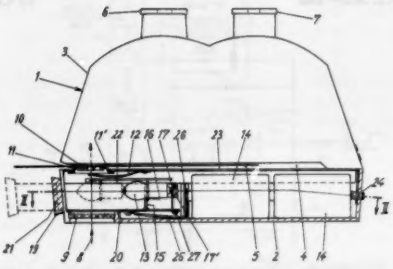
Rudi Schael, Kandinskystr. 27, D-8 Munchen 71, Fed. Rep. of Germany

Filed Jan. 26, 1976, Ser. No. 652,394

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1975, 2503379

Int. Cl.[2] F21L *7/00*; F21V *13/02, 23/04*

U.S. Cl. 362—190 **7 Claims**



1. An illumination device for a microfilm viewer, particularly for a microfilm viewer of the binocular microscope type, wherein the microfilm can be selectively illuminated directly by a light source which is either internal or external independently of each other and wherein the internal light source is independent of an outside source of energy, the improvement comprising a housing permanently attached to the microfilm viewer, a condensing lens disposed in a wall of said housing, a diffusion screen disposed in an opposite wall of said housing along the optical axis of said lens in front of said microfilm, a light bulb and a light bulb support member in said housing displaceable from a first position away from said diffusion screen to a second position placing said light bulb substantially at said optical axis behind said diffusion screen, a push-pull handle displacing said light bulb support member from said first position to said second position, switch means actuated by said push-pull handle for turning on said light bulb in said first position, a cover plate for said lens operated simultaneously by said push-pull handle for uncovering said lens when in said first position and covering said lens when in said second position, and an electrical power supply connected across said light bulb through said switch means.

4,100,592

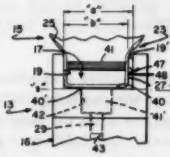
PROJECTION LIGHTING ASSEMBLY AND LAMP UNIT FOR USE THEREIN

Charles E. Henkel, Winchester, and C. Daniel Holmes, Lexington, both of Ky., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 22, 1976, Ser. No. 753,339

Int. Cl.[2] H04M *1/22*

U.S. Cl. 362—191 **19 Claims**



1. A projection lamp unit for use within an electrically insulative socket defining an opening therein having first and second spacedly positioned and parallel upstanding flat walls, said projection lamp unit comprising:

a base member including a receptacle portion, and a boxlike seating portion for being positioned within said opening within said socket;

a reflector securedly positioned within said receptacle portion of said base member;

a projection lamp securedly positioned within said receptacle portion of said base member in a substantially coaxial relationship with said reflector; and

biasing means located only on one side of said boxlike seating portion of said base member for positively engaging said first upstanding flat wall of said opening to bias said seating portion against said second upstanding flat wall and provide an interference fit between said seating portion and said upstanding flat walls of said socket.

4,100,593

GAS OPERATED UNDERWATER LAMP

Joseph N. Bond, 28 Sarina Dr., Commack, N.Y. 11725

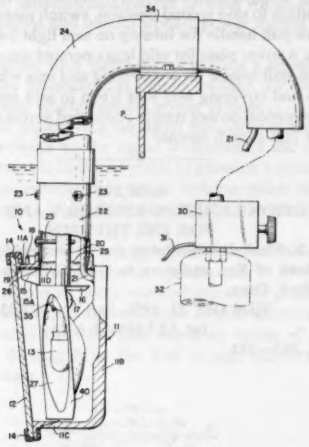
Filed Dec. 20, 1976, Ser. No. 752,020

Int. Cl.[2] F21V *29/00*

U.S. Cl. 362—267 **9 Claims**

1. A gas operated underwater lamp which comprises a watertight housing having a frontal opening, a translucent cover disposed across said opening and covering same, said cover being connected to the housing in watertight sealed relationship therewith, at least one gas burning incandescent mantle disposed within said housing, first conduit means extending into said housing and communicating with said mantle to supply gas thereto for burning thereby, second conduit means extending into said housing and communicating therewith to vent therefrom products of combustion resulting from the burning of said gas, said housing and cover having heat trans-

fer surfaces which cooperate with said mantle to prevent accumulation within the housing of condensate from products of combustion, when said housing is submersed in a cooling liquid, said housing having a top, a bottom and at least one side wall, said bottom of the housing, each side wall of the housing



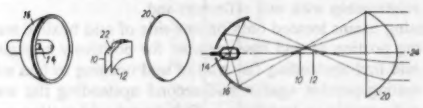
and said cover having respective coefficients of heat transfer all of which are less than the coefficient of heat transfer of the top of the housing whereby when the lamp is in operation, the top of the housing is cooler than said cover and other portions of the housing.

4,100,594

SUPPRESSION OF COLOR FRINGING IN LAMPS

Allan Victor Stewart Gould, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed Aug. 23, 1976, Ser. No. 716,577
Int. Cl.² F21M *3/00*; F21P *5/00*
U.S. Cl. 362—308 **13 Claims**



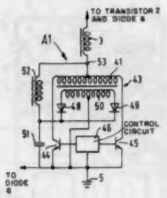
1. A lamp having an optical system for reduction of colour fringing comprising a light source, a projection lens, a mask disposed between the light source and the projection lens to define a cut-off in the projected beam and an optical element forming an image of the light source at or near the mask characterised in that for the mask comprises a nearer mask element which is nearer to the projection lens and a further mask element which is further from the projection lens, the said optical element forming a light source image between the said mask elements, the projection lens has first and second parts which are aligned generally with the masked and unmasked areas of the light source image, the nearer mask element is between the projection lens and the focus of the said first part of the projection lens whereby the said first part produces a virtual erect mask image and the further mask element is located between the light source and the focus of the second part of the projection lens whereby the second part produces a real inverted mask image.

4,100,595

CIRCUIT FOR THE PRODUCTION OF AN OUTPUT VOLTAGE DEPENDING ON AN INPUT DIRECT VOLTAGE AND A GIVEN DESIRED VOLTAGE

Werner Pollmeier, Verl, Fed. Rep. of Germany, assignor to Nisdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Nov. 24, 1976, Ser. No. 744,512
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554825
Int. Cl.² H02M *3/335*
U.S. Cl. 363—133 **5 Claims**



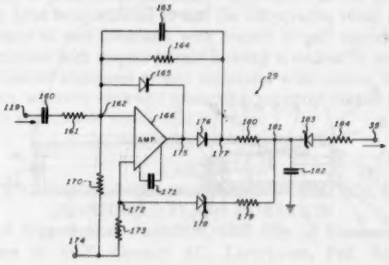
1. In a circuit for the production of an output voltage depending on an input direct voltage and a given desired voltage having a series connection comprising a longitudinal regulating member, an inductor and a push-pull current transformer which produces said output voltage and which is fed with said input direct voltage, said inductor and said push-pull current transformer being connected in parallel with a diode which becomes loaded at inductive cut-off voltages in the pass direction, the improvement comprising wherein said push-pull current transformer has a series connection of an impedance coil and a capacitor connected in parallel therewith and a pair of diodes symmetrically connected to said push-pull transformer at the one ends thereof and to each other and a connecting point between said impedance coil and said capacitor at the other ends thereof whereby voltages which are derived symmetrically from said push-pull transformer are conducted each through at least one of said pair of diodes to said capacitor.

4,100,596

PROTECTED AIRCRAFT POWER AND PHASE CONVERTER

Arland I. Olafson, and Alfred C. Setter, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 18, 1977, Ser. No. 779,421
Int. Cl.² H02M *5/293*
U.S. Cl. 363—148 **10 Claims**



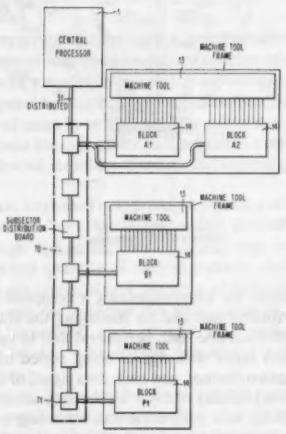
1. Protected power conversion apparatus adapted to be responsive jointly to aircraft single phase alternating current power supply means and to aircraft direct current power supply means for generating three-phase alternating current aboard an aircraft of substantially greater power level than the maximum power level of said aircraft single phase power supply means, comprising:

passive network means for shifting the phase of said single phase alternating current by substantially 90°,
gain control amplifier means having signal input means responsive to said network means,
push-pull power amplifier means responsive to said gain control amplifier means,
output transformer means having secondary winding means for providing discrete three-phase output currents,
said output transformer means having first and second primary winding means,
said first primary winding means having center tap means,
said first primary winding means being responsive to said push-pull power amplifier means, and
said second primary winding means being responsive to said single phase alternating current,
impedance means coupled to said center tap means for sensing the level of said three-phase output currents with respect to a predetermined safe value, and
limiter means responsive to said impedance means for generating a control signal only when said predetermined safe value is exceeded,
said signal input means thereupon being responsive to said limiter means control signal by reducing the output of said gain control amplifier means substantially to zero.

4,100,597
COMPUTER CONTROLLED DISTRIBUTION APPARATUS FOR DISTRIBUTING TRANSACTIONS TO AND FROM CONTROLLED MACHINE TOOLS HAVING MEANS INDEPENDENT OF THE COMPUTER FOR COMPLETING OR STOPPING A TOOL FUNCTION INITIATED BY A COMPUTER TRANSACTION

Alan J. Fleming, Poughquag, N.Y., and Larry W. Holmstrom, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,161
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—474 **6 Claims**

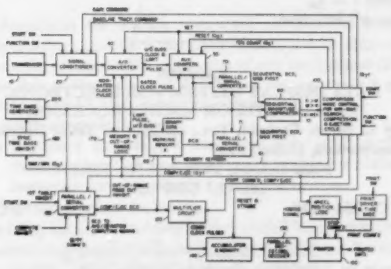


1. A system for controlling a plurality of machine tools comprising
a central processor containing control programs for said machine tools,
a plurality of tool controllers each operatively associated with a machine tool and under the control of said central processor through data instructions communicated from said central processor, and
a multiple channel data bus connected between the central processor and each of the controllers for the communication of said data instructions and other data transactions between the processor and a controller by the transferring of parallel bits of data to and from the processor,
each of said controllers comprising
at least one tool control unit, adapted, in response to data instructions communicated from the central processor, to provide a digital output to the associated machine tool for controlling a tool function and/or for receiving from said tool, a digital input indicative of a tool condition, and
means for completing a controlled tool function initiated by a data instruction transaction from the central processor after all data transactions are completed and the processor is no longer in communication with the tool controller.

4,100,598
TABLET PRESS RELATED INSTRUMENTATION FOR USE IN DEVELOPMENT AND CONTROL OF FORMULATIONS OF PHARMACEUTICAL GRANULATIONS

Donald Melvyn Stiel, Pinebrook; Charles Robert Browski, Jersey City; Eric Neugroschel, Metuchen, and Joseph James Williams, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 610,706, Sep. 5, 1975, abandoned. This application Aug. 13, 1976, Ser. No. 714,141
Int. Cl.[2] G06F *15/00;* B28B *3/00;* B29C *3/06*
U.S. Cl. 364—476 **13 Claims**



1. Apparatus for use in the development of tabletted granulations comprising:
first means mounted on a tablet press for sensing the forces effected in the tabletting of a granulation and for generating therefrom an analog signal containing compression force and ejection force peak information;
second means connected to said first means for converting said analog signal to a digital representation thereof; and
third means responsive to said second means for automatically distinguishing compression force from ejection force for any one or more tablet formations and for individually deriving in digital form peak compression force and ejection force for each such tablet formation.

4,100,599
METHOD AND APPARATUS FOR DETERMINING VELOCITY OF A MOVING MEMBER

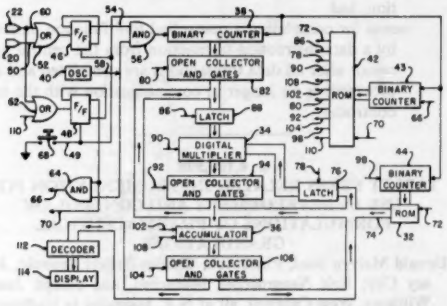
Robert B. Nally, Waterloo, Canada, assignor to NCR Canada Ltd. - NCR Canada LTEE, Mississauga, Canada

Filed Dec. 22, 1976, Ser. No. 753,044
Int. Cl.[2] G01P *3/36;* G06F *15/20*
U.S. Cl. 364—565 **16 Claims**

7. A system for generating a value of the velocity of a moving member comprising:
(a) means for generating a signal representing the time (*t*) of movement of the member through a predetermined distance (*d*);
(b) means for storing the value of time;

(c) means for storing values representing the velocity and the successive derivatives of the velocity at a preselected mean value of the time (t_m) of movement through said distance;

(d) and means for adding and multiplying the value of time and the values representing the velocity and the successive derivatives of the velocity to derive a value of the



velocity of the moving member in accordance with the terms of a Taylor series expansion of the equation d/t developed using the following equation:

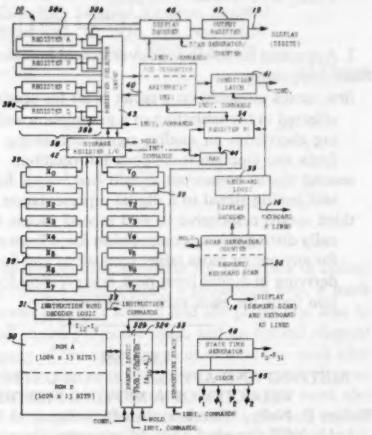
$$V^n(t_n) = [d^n V(t)/dt^n]$$

wherein $t = t_m$
$n = n^{th}$ derivtive.

4,100,600
DATA DISPLAY SYSTEM FOR ELECTRONIC CALCULATOR OR MICROPROCESSOR

Larry L. Miles, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 736,274
Int. Cl.² G06F 3/14
U.S. Cl. 364—710 **6 Claims**



1. An electronic calculator system having an input means for receiving numeric data and function commands, an arithmetic unit for performing arithmetic operations on the numeric data received by said input means, a memory for storing a number of instruction words and addressable in response to said function commands, instruction word decoder means for decoding instruction words and for controlling said arithmetic unit in response thereto, first and second operational registers for storing numeric data received by said input means and numeric data outputted from said arithmetic unit and a display means for displaying numeric data stored in a first one of said operational registers, said electronic calculator system characterized in that a display decoder is provided, said display decoder comprising:

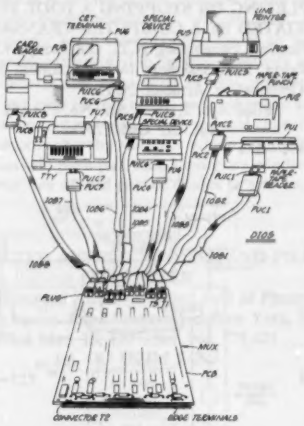
(a) first logic means responsive to the contents of said first one of said operational memories for providing signals to said display means for actuating said display means to provide a visual display of the numerals represented by the data stored in said first one of said operational registers and

(b) second logic means responsive to the contents of a second one of said operational registers for selectively suppressing said signals to said display means and for providing further signals to said display means enabling said display means to provide a visual display of at least one decimal point.

4,100,601
MULTIPLEXER FOR A DISTRIBUTED INPUT/OUT CONTROLLER SYSTEM

Phillip A. Kaufman, Irvine, and Jerry R. Washburn, Alhambra, both of Calif., assignors to Computer Automation, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 644,412, Dec. 24, 1975. This application Jan. 9, 1976, Ser. No. 647,762
Int. Cl.² G06F 3/00, 5/04
U.S. Cl. 364—200 **9 Claims**



1. In a system for interconnecting a computer unit and at least one peripheral unit and for managing the transfer of sets of data signals from one such peripheral unit to said computer unit, each such set of data signals being coded to represent a word or a portion thereof, and each data signal of each such set having one of a plurality of logic levels, each set of data signals transmitted from said peripheral unit including one signal of each set that represents the parity state of other signals in said set,

a device for selectively forcing the logic level of said one data signal of each set to a predetermined value, said device comprising:

means for selecting said one data signal;

means controlled by signals from such computer unit for selecting a predetermined logic level for said selected one data signal;

logic circuit means for receiving said selected data signal and adapted to transfer said selected data signal with other data signals of such set to said computer unit and for substituting for said selected data signal a substitute data

signal having a logic level equal to said selected predetermined logic level; and

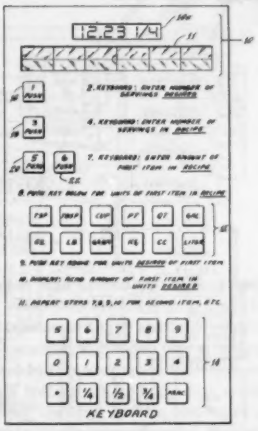
means to transfer to said computer unit said substitute signal in place of said selected signal, and also to transfer the remainder of said set of data signals to said computer unit.

4,100,602

RECIPE CONVERSION CALCULATOR

Ascher H. Shapiro, Jamaica Plain, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 10, 1976, Ser. No. 740,638
Int. Cl.² G06F *5/00*
U.S. Cl. 364—715 **7 Claims**



1. For converting recipes from a given number of servings and given units of measure to a desired number of servings and desired units of measure, a calculator including:

a control panel having keys and associated indicia describing a series of steps by which the user enters data and control signals into the calculator in a sequence compatible with the dedicated structure thereof, said control panel including

a numeric keyboard comprising a plurality of individually actuatable keys for entering the desired number of servings, the given number of servings and the given numerical quantity of each ingredient, and

a keyboard comprising a plurality of individually actuatable keys for entering the given units of measure for each ingredient, each of said keys representing and being labeled with indicia denoting a specific unit of measure;

divider means for operating upon signals representing the desired number and given number of servings to establish the ratio of the desired number to the given number;

register means for storing the calculated servings ratio;

divider means for calculating a conversion factor as a function of desired units and given units of measure;

means for multiplying the signal representing the given numerical quantity of an ingredient by a signal representing the conversion factor to generate a signal representing the correct numerical amount of the ingredient for the desired number of servings and the desired units of measure; and

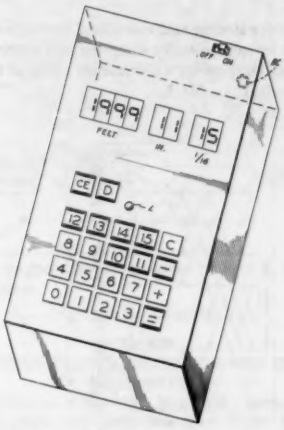
display means for providing a visual representation of the last-mentioned signal and of the desired units of measure associated therewith.

4,100,603

FEET, INCHES AND SIXTEENTHS ADDER

John Oliver Boyd, Houston, Tex., assignor to Joseph Lyndon Boyd, Houston, Tex.

Filed Dec. 16, 1976, Ser. No. 751,448
Int. Cl.² G06F *7/50*
U.S. Cl. 364—771 **23 Claims**



1. Apparatus for adding compound denominate numbers which numbers include a plurality of component dimensions wherein the greatest ratio of the size of any component dimension to that of the next most significant component is k and k is greater than 10, said apparatus comprising:

A. input means including:

a keyboard including k numerical keys, and encoding means controlled by the keyboard for binary coding all numerals forming a base k counting system,

B. operating means including:

adding means for adding binary coded base k numerals,

modifying means for correcting the result from the adding means when adding numerals belonging to numbers counted in number systems having a base lower than k,

C. timing means including:

entering means for successively feeding the binary coded numerals composing the denominate number from said input means to said adding means, least significant numerals first, and activating the modifying means when numerals belonging to numbers counted in number systems having a base lower than k are being added; and

D. output means including:

readout means to show the corrected result.

4,100,604

FREQUENCY DOMAIN AUTOMATIC EQUALIZER UTILIZING THE DISCRETE FOURIER TRANSFORM

Donald A. Perreault, Thousand Oaks, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 19, 1976, Ser. No. 706,703
Int. Cl.² G06F *7/38*
U.S. Cl. 364—827 **32 Claims**

1. A frequency domain equalizer for automatically equalizing the discrete Fourier components X_n of a received electrical signal $x(t)$ transmitted through a transmission channel comprising:

(a) means for sampling a test pulse transmitted through said transmission channel for providing a discrete set of test sample values f_k, where $k = 0, 1 \ldots N-1$, and N is an integer,

(b) means for calculating the discrete Fourier transform of

said test sample values f_k to provide the discrete Fourier components F_n, $n = 0, 1 \ldots N-1$,

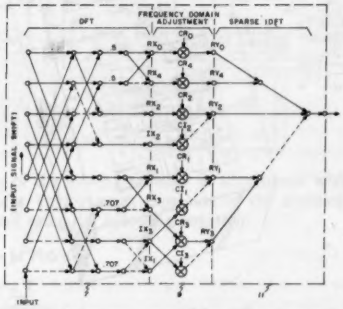
(c) means for providing reference values H_n representing the discrete Fourier components corresponding to an ideal, undistorted test pulse,

(d) means for calculating a correction factor C_n for each value F_n such that

$$C_n \cdot F_n = H_n,$$

(e) means for storing said calculated correction factors C_n,

(f) means for subsequently sampling said received electrical signal $x(t)$ to provide a discrete set of signal sample values x_k, $k = 0, 1 \ldots N-1$,



(g) means for calculating the discrete Fourier transform of said signal sample values x_k to provide the discrete Fourier components X_n,

(h) means for multiplying X_n by the stored correction factors C_n to produce frequency equalized components Y_n for $n = 0, 1 \ldots N-1$ where

$$Y_n = C_n \cdot X_n, \text{ and}$$

(i) means for calculating the inverse discrete Fourier transform of the components Y_n to provide an output signal in the time domain corresponding to said received electrical signal.

4,100,605

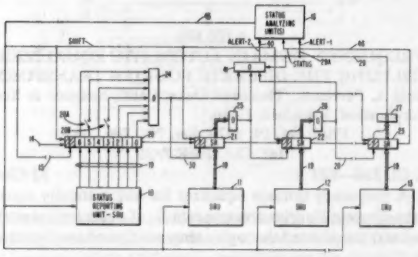
ERROR STATUS REPORTING

Bruce James Holman, Broomfield, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,512

Int. Cl.[2] G06F *1/00*

U.S. Cl. 364—900 **9 Claims**



1. A digital signal propagation unit, including in combination,

a first plurality of shift registers, each said shift register having a plurality of settable shift register stages, and being interconnected as a single string of serially connected shift registers, and

a plurality less than said first plurality of OR circuits respectively receiving signals from stages of predetermined ones of said plurality of shift registers and each said OR circuits each having an output connected to one of said shift register stages in other than those shift registers from which signals are received by such OR circuit.

4,100,606

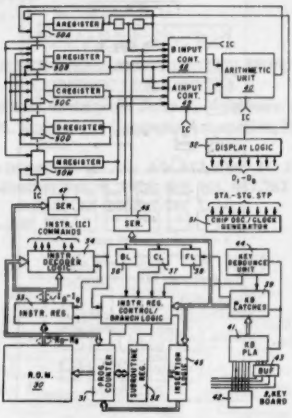
KEY DEBOUNCE SYSTEM FOR ELECTRONIC CALCULATOR OR MICROPROCESSOR

George Lawrence Brantingham, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 9, 1977, Ser. No. 767,086

Int. Cl.[2] G06F *3/02, 9/00*

U.S. Cl. 364—900 **20 Claims**



1. A key debounce system for an electronic microprocessor system having a data memory for storing numeric data, an arithmetic unit for performing arithmetic operations on the data stored in said data memory, a program counter, an instruction memory for storing a plurality of instruction words controlling the operation of said microprocessor system, including the controlling the transfer of data from said data memory to said arithmetic unit, one of said plurality of instruction words being outputted once each instruction cycle of said microprocessor system according to an instruction word address in said program counter and keyboard sensing means for interfacing said microprocessor system with a keyboard having a plurality of keys, said key debounce system comprising:

(a) means for loading a starting instruction word address in said program counter, said starting instruction word address being generated according to the sensing of the depression of a key on said keyboard by said sensing means, said starting instruction work address being the first address of a set of instruction words collecting said microprocessor system to perform the function indicated by the key depressed;

(b) means for detecting the reading out of particular instruction word from said instruction memory, said particular instruction word being included among said sets of instruction words; and

(c) means for coupling said sensing means and said loading means, said coupling means being disabled after said sensing means has detected a key depression and after said coupling means has coupled information regarding the particular key depressed between said sensing means and said loading means and until:

(i) said detecting means detects the reading out of said particular instruction, and

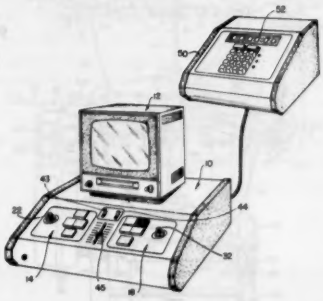
(ii) no additional key depression is detected by said sensing means during a preselected period having a duration of a plurality of said instruction cycles.

4,100,607

COMPUTER FOR VIDEO TAPE EDITING SYSTEM

William D. Skinner, Newport Beach, Calif., assignor to Convergence Corporation, Irvine, Calif.

Filed Feb. 7, 1977, Ser. No. 765,902
Int. Cl.² G06F *1/00*; H04N *5/785*
U.S. Cl. 364—900 **11 Claims**



1. In combination with a video tape editing system for transferring selected video information from a first video tape in a playback video tape recorder to a second video tape in a record video tape recorder, said video tape editing system being controllable to establish a start insert time with respect to the video information transferred from the first video tape to the second video tape, the first and second tapes each having frame-indicating control pulses recorded thereon; a counter circuit connected to said editing system and responsive to the control pulses for producing digital time signals; and a computer connected to the tape editing system and to the counter circuit, said computer including, a digital display circuit, a keyboard, encoding circuitry connected to said keyboard, and logic circuitry connected to said encoding circuitry and to said display circuit to cause the computer to provide an end insert time to the editing system as established by a predetermined time value set up in the display circuit by operation of the keyboard.

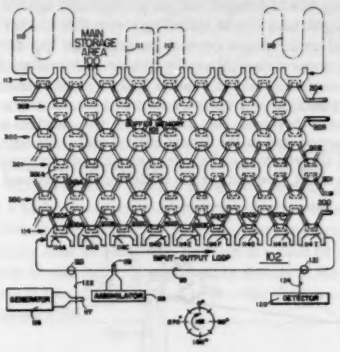
4,100,608

EXCHANGE STACK BUFFER MEMORY

Peter K. George, San Jose, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 28, 1977, Ser. No. 773,101
Int. Cl.² G11C *19/08*
U.S. Cl. 365—2 **9 Claims**

1. A magnetic bubble domain memory system comprising
means for establishing and supporting magnetic bubble domains,
main storage means for storing said magnetic bubble domains,
input-output means for supplying and receiving said magnetic bubble domains to and from said main storage means, and
buffer memory means interposed between said main storage means and said input-output means for temporary storage of said magnetic bubble domains,
said buffer means including an array of discrete storage areas disposed in rows and columns, and conductor means associated with each row of storage areas in said buffer memory means to selectively control move-



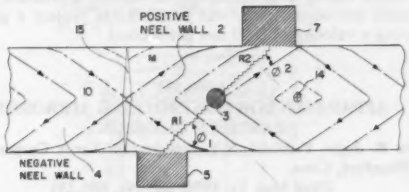
ment of magnetic bubble domains relative to each row of storage areas.

4,100,609

MAGNETORESISTANCE DETECTOR FOR CROSSTIE MEMORIES

Leonard J. Schwee, Colesville; Henry R. Irons, Beltsville; Wallace F. Anderson, Beltsville; Kurt Peter Scharnhorst, Beltsville, and Albert D. Krall, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 3, 1976, Ser. No. 720,295
Int. Cl.² G11C *19/08*
U.S. Cl. 365—87 **32 Claims**



13. A serially accessible crosstie memory element, comprising:
a ferromagnetic layer of uniform thickness having regular, symmetrically disposed serriform margins;
a first electrical potential coupled to a first point adjacent to one of the margins;
a second electrical potential coupled to a second point adjacent to one of the margins; and,
a voltage sensitive means coupled across a ground potential and a location disposed about the first and second points and centered between the margins.

4,100,610

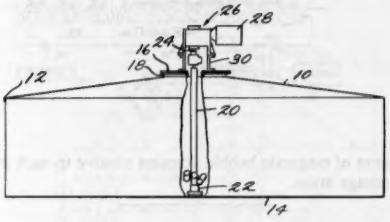
ROTATING NOZZLE SPARGING SYSTEM FOR SUSPENSION FERTILIZER TANKS

Douglas Johnston, Decatur, and Robert L. Jannen, Huntsville, both of Ala., assignors to John Blue Company Division of Subscription Television, Inc., New York, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,644
Int. Cl.² B01F *7/16*; F16K *31/12*
U.S. Cl. 366—102 **6 Claims**

1. A sparging means for use in a cylindrical tank having a top, containing liquids having insoluble suspensions therein

that may tend to deposit or crystallize out of the solution on a surface if the liquid is not agitated from time to time, comprising a source for a compressed gas, a distributor means for directing jets of compressed gas periodically against the area to be sparged, said means including a movable header for sweeping said area, means carried on said tank top to rotate said header about a vertical axis cyclically over said area, said drive means including a motor and a hollow shaft connected to said compressed gas source and adapted to be rotatably driven and connected between the motor and the header, said header being supported at the lower end of said shaft and being connected thereto to receive the compressed gas supplied to the hollow shaft, conduit means to deliver compressed gas to said



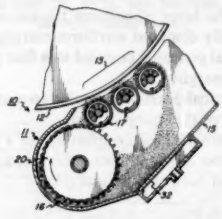
header, a plurality of nozzles on said header and communicating with the compressed gas delivered thereto, each of said nozzles directing jets of compressed gas against different but overlapping confined portions of said area respectively whereby to produce a periodic agitating action over all of the area to be sparged with each cycle that said header sweeps the area, said nozzles being sized progressively to have outlet orifices of 1/16 inch at the end of the header adjacent said axis and 7/32 inch at the end of the header, said compressed gas being supplied in the form of air compressed to a pressure of 150 pounds per square inch, said nozzles having automatically actuated valves therein adapted to close at a pressure of 25 pounds per square inch, and said nozzles project a gas jet having a velocity of 2000 feet per second.

4,100,611

APPARATUS FOR CONTROLLING AIRBORNE PARTICLE EMISSION

Don B. Jugle, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 11, 1976, Ser. No. 685,231
Int. Cl.[2] B01F *13/06*
U.S. Cl. 366—139 **3 Claims**



1. An improved filtering apparatus for suppressing airborne particle emission from a partially open container comprising

a partially open container for containing a two component powder including a relatively large component and a relatively small component,

means for agitating said two component powder to cause at least a portion of said small component to become airborne particles,

means for generating an air flow into said container through the agitated powder to recombine said airborne particles therewith and

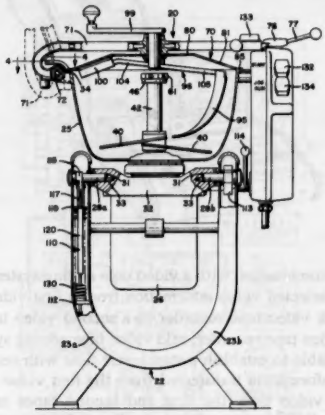
filter means positioned to receive the air flow and any uncombined airborne particles, said filter means having openings smaller than said uncombined particles and being positioned so as to be continuously cleaned by the flow of the two compound powder thereacross.

4,100,612

FOOD PROCESSING APPARATUS

Richard D. Hoover; Raymond P. Shaeffer, and Donald A. Brackman, all of c/o Hobart Corporation, World Headquarters, Troy, Ohio 45374

Filed Jun. 6, 1977, Ser. No. 803,460
Int. Cl.[2] B01F *7/16*
U.S. Cl. 366—143 **9 Claims**



1. In an apparatus for processing foodstuffs, including a mixing bowl having a drive shaft extending into the bowl through the bottom thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, and a cover system including a lid for closing the top of the bowl, the improvement comprising:

a. a resilient lid scraper mounted for rotation in scraping contact with the inner surface of the lid,

b. means for rotating said lid scraper around the inner surface of the lid, and

c. the lid being formed of substantially transparent material to provide for viewing the foodstuffs within the bowl with the lid closed and while the motor and food processing blades are being operated without splashing or losing foodstuffs from the bowl, said lid scraper removing and returning foodstuffs from the lid inner surface to the body of foodstuffs within the bowl, and clearing the foodstuffs from said transparent lid for easier viewing when rotated around the inner surface of the lid.

4,100,613

FOOD PROCESSING APPARATUS

Raymond P. Shaeffer, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jun. 6, 1977, Ser. No. 803,458
Int. Cl.[2] B01F *7/16*
U.S. Cl. 366—143 **5 Claims**

1. A cover system for closing the top of an apparatus for processing foodstuffs, the apparatus including a mixing bowl having a drive shaft extending into the bowl from the bottom thereof, a motor mounted outside the bowl and connected to

rotate the drive shaft, and food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, comprising:

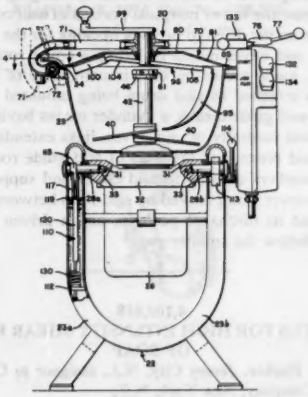
a. a rigid lid support member,

b. means for securing said lid support member across the top of the bowl,

c. a lid including:

i. a central flexible portion attached to and supported by said support member,

ii. an outer stiff portion surrounding and extending from and beyond said central flexible portion, and



iii. a rim on the outer edge of said stiff portion dimensioned for engaging the upper edge of the mixing bowl, and

d. means for securing said support member and said lid in closed position with said lid rim against the edge of the bowl, and for pressing said support member downwardly against the lid to secure and seal said lid rim against the edge of the bowl, said flexible portion of said lid acting as a spring in response to the downward pressure of said support member thereagainst.

4,100,614

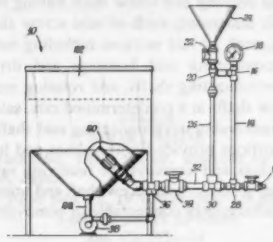
METHOD FOR POLYMER DISSOLUTION

Mikkel G. Mandt, Cedar Falls, Iowa, assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Jun. 18, 1976, Ser. No. 697,580

Int. Cl.[2] B01F *5/02, 5/04, 5/20*

U.S. Cl. 366—154 **4 Claims**



1. In a method for uniformly dissolving a predetermined amount of comminuted organopolymeric water and waste water flocculent in a predetermined amount of water to provide an aqueous flocculent polymer solution containing about .5 percent or less by weight of the flocculent polymer, including the step of introducing the organopolymer flocculent into the interior of a hollow liquid jet of water formed from a pressurized source having a pressure of at least 10 psig. and dispersing the organopolymer flocculent therein to provide a liquid-polymer mixture stream, the improvement comprising subjecting the liquid-polymer mixture stream to ejector mixing in a first ejector mixing zone in which a motive stream of water from a pressurized source having a pressure of at least 10 psig. is provided, and in which said liquid-polymer mixture stream is the educted, secondary stream from said first ejector mixing zone, the ratio of said motive water stream to said secondary polymer mixture being in the range of from about 0.4 to about 1.6, to provide an ejector mixed stream, discharging said ejector mixed stream at a feed pressure of about 10 psig. or less through a second ejector mixing zone as a second motive stream into a tank mixing zone of predetermined volume, said second motive stream serving to educt polymer solution from said tank mixing zone as a secondary stream at a ratio of second motive stream to said tank zone secondary stream in the range of from about 0.4 to about 1.6, and to provide fluid mixing in said tank mixing zone.

4,100,615

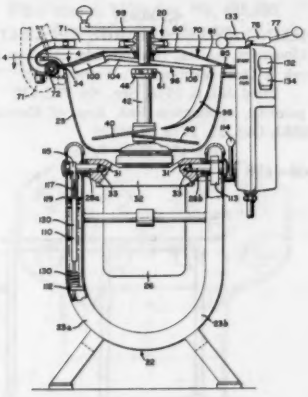
FOOD PROCESSING APPARATUS

James W. Thompson, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jun. 6, 1977, Ser. No. 803,462

Int. Cl.[2] B01F *7/16*

U.S. Cl. 366—169 **1 Claim**



1. In an apparatus for processing foodstuffs, including a mixing bowl having a drive shaft extending into the bowl through the bottom center thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, a cover system including a lid for closing the top of the bowl, and a mixing baffle blade and support mounted through the center of the lid for rotation along and around the inside surface of the bowl for removing and returning foodstuffs from the side of the bowl to the vicinity of the food processing blades for further processing thereby, the improvement comprising means defining a hollow drive shaft for said mixing baffle blade and support connecting through the center of the lid and being open in the top and bottom thereof for introducing liquids into the mixing bowl directly over the food processing blades and drive shaft while the motor is being operated.

4,100,616

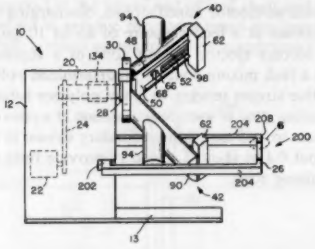
DOCKING STATION

William Wilson, 716 Scott St., Stroudsburg, Pa. 18360

Continuation-in-part of Ser. No. 608,945, Aug. 29, 1975, which is a continuation-in-part of Ser. No. 321,436, Jan. 5, 1973, abandoned. This application Jan. 25, 1977, Ser. No. 762,786

Int. Cl.[2] B01F *9/04;* **B66C** *1/66*

U.S. Cl. 366—213 **24 Claims**



1. A docking station for supporting and rotating a container comprising a first member, two arms, said arms being coupled to said first member for rotation with said first member and being angularly disposed with respect to each other to define a zone in which a container that is to be supported by said arms will be received, locking means mounted on each of said arms for selective movement into and out of locking engagement with a container to selectively retain it on said arms, means for causing said selective movement coupled to said locking means, and means for rotating said first member.

4,100,617

MIXING AND DISCHARGE APPARATUS

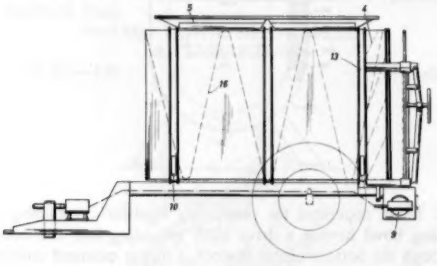
Abraham Hoopman, Aalten, Netherlands, assignor to Hoopman Onderzoek & Ontwikkeling BV, Netherlands

Filed Jul. 6, 1976, Ser. No. 702,430

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1975, 2530553; Oct. 21, 1975, 2546975

Int. Cl.[2] B01F *9/06*

U.S. Cl. 366—188 **3 Claims**



1. A mixing and discharge apparatus for mixing feed and for uniformly discharging the mixed feed comprising a supporting frame, a hollow drum mounted for rotation on said frame for turning about a longitudinal axis of the drum, means providing an inlet opening into said drum for charging the same with feed, means defining an open discharge end for said drum through which mixed feed may discharge, conveyor plates fixed to the inner wall of the drum for turning with the drum to mix the feed while in said drum and for conveying the feed alone toward said discharge end of the drum, said conveyor plates providing the sole and only conveying of said material in said drum, a cover means mounted at the discharge end of said drum for movement between a closed postion covering said open discharge end of the drum and discharging position in which at least the lower marginal portion of said cover means is spaced from the drum to provide opening for the material to discharge, said cover means including a cover rotatable with said drum, guide means on the circumference of said drum, guide rods attached to said drum being mounted for sliding motion in said guide means, a cylinder means having a piston being located centrally of said cover, links extending radially between said piston and the ends of said guide rods, and anchoring members secured to said cover and supporting said links, said cover being moved by said links between its closed position and its discharge position, and a driven cross feed conveyor below the annular gap.

4,100,618

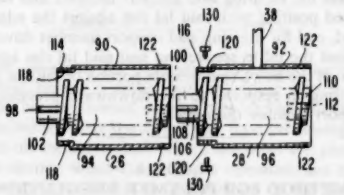
APPARATUS FOR HIGH INTENSITY SHEAR REFINING OF SOAP

Charles F. Fischer, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 575,275, May 6, 1975, abandoned. This application Aug. 11, 1976, Ser. No. 713,548

Int. Cl.[2] B01F *7/08*

U.S. Cl. 366—297 **6 Claims**



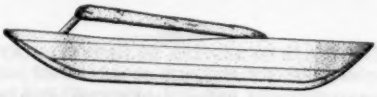
1. An apparatus for the continuous production of soap comprising a plurality of detachable and replaceable sections, each of said sections including a housing and a screw shaft that are coextensive said housing and screw shaft having substantially the same length dimension, each of said screw shafts having flights thereon, each of said sections including means for removably interconnecting said housings and drivingly and removably interconnecting shafts, and rotating means for rotating said screw shafts at a predetermined rate, said means for drivingly and removably interconnecting said shafts including reduced end portions provided with splines and having complementary sockets and keyways for receiving said end portions and splines, whereby said screw shaft and housing of each section are simultaneously connectable or removable as a unit.

DESIGNS

JULY 11, 1978

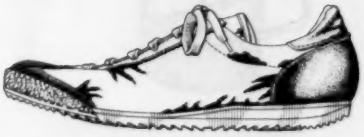
248,426
CHAIR BACK ATTACHABLE BABY RETAINING ARTICLE
Mary Jane Hill, and John R. Hill, both of 3425 W. Gelding Dr., Phoenix, Ariz. 85053
Filed May 3, 1976, Ser. No. 682,206
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—27

248,427
SANDAL
James K. Wong, 46-194 Nona Loop, Kaneohe, Hi. 96744
Filed Sep. 13, 1976, Ser. No. 722,615
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270

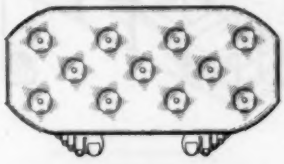


248,428
SPORT SHOE
Sigenobu Watanabe, Kobe, Japan, assignor to Onitsuka Co., Ltd., Kobe, Japan
Filed Sep. 22, 1976, Ser. No. 725,409
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

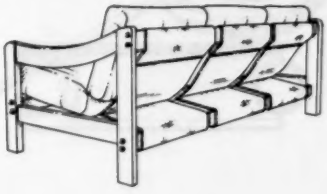
248,429
SPORT SHOE
Masanobu Inohara, Akashi, Japan, assignor to Onitsuka Co., Ltd., Kobe, Japan
Filed Sep. 22, 1976, Ser. No. 725,467
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



248,430
FOOTSTOOL
Larry E. Bussey, 2537 Seventh St. NE., Canton, Ohio 44704, and James E. Hunter, Jr., 1300 Cherry St. SE., Canton, Ohio 44707
Filed May 6, 1976, Ser. No. 683,663
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36



248,431
SOFA OR SIMILAR ARTICLE
Eugene J. Costabile, Oak Lawn, Ill., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Nov. 11, 1975, Ser. No. 630,857
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

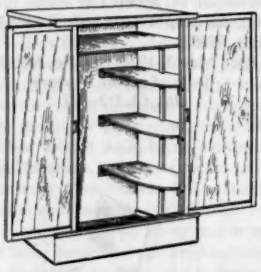


248,432
CHAIR OR SIMILAR ARTICLE
Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc.
Filed Jul. 20, 1976, Ser. No. 706,945
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72

248,433
BRACKET FOR HOLDING FISHING RODS OR THE LIKE
Robert H. McCollum, 2833 Merlin Ave., Fullerton, Calif. 92635
Filed May 27, 1976, Ser. No. 690,533
Term of patent 14 years
Int. Cl. D22—*05;* D6—*04;* D8—*08*
U.S. Cl. D6—125

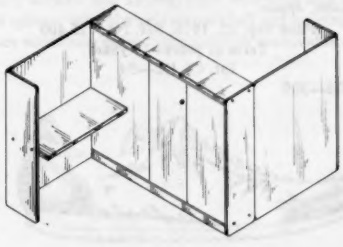
248,434
HANGER FOR GARDEN UTENSILS
Franco Clivio, and Dieter Raffler, both of Mozartstr. 20, D79 Ulm, Fed. Rep. of Germany
Filed Nov. 11, 1976, Ser. No. 741,003
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 741
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D6—125

248,435
CABINET
Paul M. Densen, 611 Mountain Dr., South Orange, N.J. 07052
Filed Sep. 27, 1976, Ser. No. 727,212
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159



248,436
JEWELRY CABINET
Raymond T. Paszkiewicz, 6424 Frankfort Ave., Baltimore, Md. 21206
Filed Oct. 21, 1976, Ser. No. 734,482
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167

248,437
COMBINED DUAL WORK TABLE AND STORAGE CABINET UNIT
Anthony John Robinson, Woollahra, Australia, assignor to Framac Industries Pty. Limited, Australia
Filed Sep. 21, 1976, Ser. No. 725,076
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—168

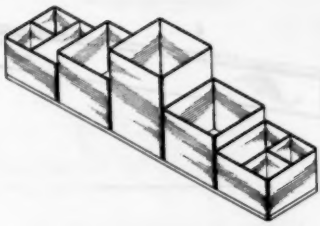


248,438
MIRROR FRAME
David Tougas, Santa Monica; Peter Adler, and Mark Liszt, both of Los Angeles, all of Calif., assignors to Lucid Lines, Inc., Culver City, Calif.
Filed Mar. 31, 1977, Ser. No. 783,292
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—241

248,439
SPOON OR SIMILAR ARTICLE OF FLATWARE
Ben Siebel, 53b Harrison St., New York, N.Y. 10013, assignor to Oxford Hall Silversmiths, Ltd., New York, N.Y.
Filed Nov. 8, 1976, Ser. No. 739,911
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

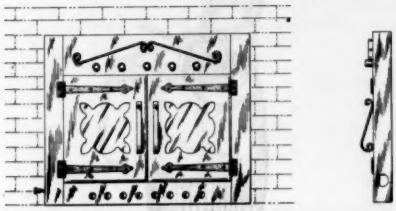
248,440
PICNIC JUG
Neill Edward Bryan; Regis Dean Schulte, and Benjamin Charles Baugh, all of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.
Filed Jun. 28, 1976, Ser. No. 700,159
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—61

248,441
BAR ORGANIZER FOR STRAWS AND TOOTHPICKS
Dale I. Bausch, 4752 Fairhope Dr., La Mirada, Calif. 90638
Filed Jul. 6, 1976, Ser. No. 702,511
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—75



248,442
GIMBALED GRILL FOR BOATS
Frederick S. Rosenberg, 4200 California Rd., Orchard Park, N.Y. 14127
Filed Jul. 19, 1976, Ser. No. 706,191
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—109

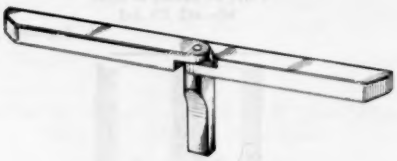
248,443
FIREPLACE SCREEN
Anthony Mancarella, Peters La., Rockfall, Conn. 06481
Filed Feb. 25, 1977, Ser. No. 771,900
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—208



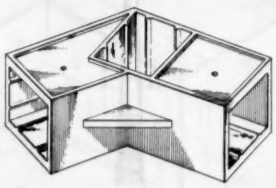
248,444
PANIC OPERATOR FOR EXIT DOORS
Roger J. Folger, Whittier, and John A. Buzard, Yorba Linda, both of Calif., assignors to Adams Rite Manufacturing Co., Glendale, Calif.
Filed May 19, 1976, Ser. No. 688,489
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—302

248,445
KNOB
James Marshall Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 1, 1976, Ser. No. 746,385
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—310

248,446
HINGE
Kenneth W. Mueller, 1126 N. Formosa Ave., Los Angeles, Calif. 90046
Filed Jun. 14, 1976, Ser. No. 695,982
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—323



248,447
FRAMING COMPONENT
Helmut J. F. Hornung, 10326 NE. 185th, Bothell, Wash. 98011
Filed Dec. 13, 1976, Ser. No. 749,978
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354



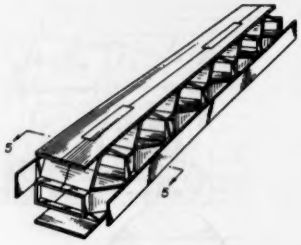
248,448
COMBINED SQUEEZE TYPE EYE WASH DEVICE AND SEALING CAP THEREFOR
George R. McClure, Little Falls, and Bruce E. Kahn, West Orange, both of N.J., assignors to Bel -Art Products, Inc., Pequannock, N.J.
Filed Apr. 22, 1976, Ser. No. 679,458
Term of patent 14 years
Int. Cl. D9—*01;* D24—*04*
U.S. Cl. D9—10

248,449
BOTTLE
Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 10, 1976, Ser. No. 740,511
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—111

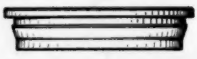
248,450
BOTTLE
Kenji Ekuan, Tokyo, Japan, assignor to Kikkoman Shoyu Co., Ltd., Noda, Japan
Filed Aug. 13, 1976, Ser. No. 714,266
Claims priority, application Japan, Jun. 17, 1976, 51-22929
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—128

248,451
PACKAGING CONTAINER
Morris Simon Freed, Newton Centre, and George Walter Ward, Framingham, both of Mass., assignors to Data General Corporation
Filed Dec. 22, 1975, Ser. No. 643,449
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184

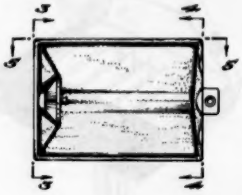
248,452
EGG CARTON OR THE LIKE
Toni Casutt, Kirchweg 45, 8102 Oberengstringen, Switzerland
Filed Mar. 6, 1975, Ser. No. 556,134
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—190



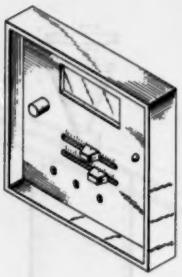
248,453
RESEALING CLOSURE
Kenneth L. Summers, Hudson, Ind., assignor to Riche Corporation
Filed Jun. 1, 1976, Ser. No. 691,611
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



248,454
HEATER CONTROL UNIT
James P. McMullan, 2630 Seaman, El Monte, Calif. 91733
Filed Sep. 27, 1976, Ser. No. 726,741
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50



248,455
COVER PLATE FOR A DIGITAL TEMPERATURE CONTROL
Edward T. Cunnie, Monroeville, Pa., assignor to Emerson Electric Co., St. Louis, Mo.
Filed May 13, 1976, Ser. No. 686,125
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—60



248,456
HEM MEASURING STICK
Eva DeLuca, 25 Sutton Place South, New York, N.Y. 10022
Division of Ser. No. 416,609, Nov. 16, 1973, Pat. No. 239,513.
This application Dec. 19, 1975, Ser. No. 642,616
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71

248,457
COMBUSTION GAS ANALYZER FOR MEASURING TEMPERATURE, SMOKE DENSITY AND CO_2 OF FLUE GAS OF AN OIL OR GAS BURNER

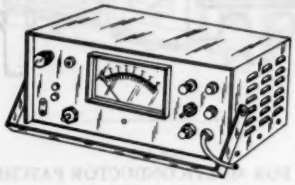
Daniel Cullinane, Jr., Topsfield, Mass., assignor to Lynn Products Co., Inc., Lynn, Mass.

Filed Aug. 4, 1975, Ser. No. 601,265

Term of patent 14 years

Int. Cl. D10—*04*

U.S. Cl. D10—81



248,458
EARRING FASTENER

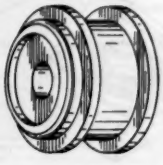
Norman Gatof, New York, N.Y., and Robert Russell, Cranston, R.I., assignors to Ciani, Inc., New York, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,831

Term of patent 14 years

Int. Cl. D11—*01*

U.S. Cl. D11—88



248,459
CROSS

Lawrence D. Newman, Keystone Junior College, La Plume, Pa. 18440

Filed May 27, 1976, Ser. No. 690,680

Term of patent 14 years

Int. Cl. D31—*00*

U.S. Cl. D11—96

248,460
JACK

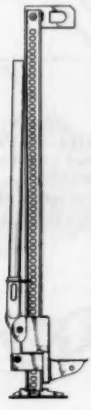
Keith T. Dunn, Solsberry, and Thomas K. McIntosh, Bloomfield, both of Ind., assignors to The Bloomfield Manufacturing Co., Inc.

Filed May 24, 1976, Ser. No. 689,574

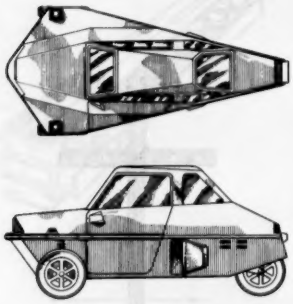
Term of patent 14 years

Int. Cl. D12—*05*

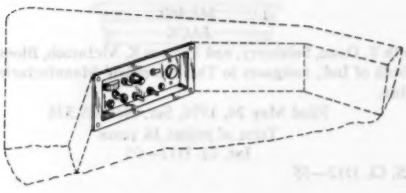
U.S. Cl. D12—55



248,461
THREE-WHEELED VEHICLE
O. David Edmonson, 6276 Greenleaf Trail, Apple Valley, Minn. 55124
Filed Jul. 9, 1976, Ser. No. 703,758
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—85

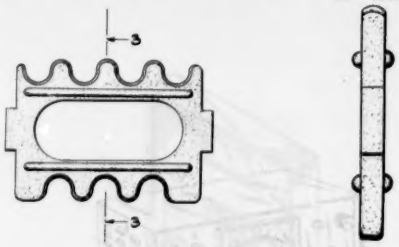


248,462
BOAT CONTROL PANEL
Stuart D. Bell, Quincy, Ill., assignor to Meco-Lectro Products, Inc., Kansas City, Kans.
Filed Sep. 20, 1976, Ser. No. 724,908
Term of patent 14 years
Int. Cl. D12—*06, 16*
U.S. Cl. D12—192

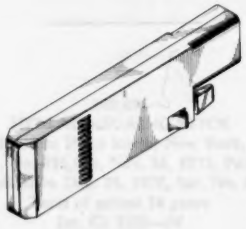


248,463
EXHAUST PIPE
Robert Barnes, 420 Leopard Lilly La., Sparks, Nev. 89431
Filed Apr. 4, 1975, Ser. No. 564,882
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—194

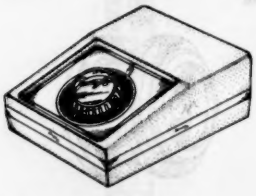
248,464
INSULATOR FOR SUPPORTING THE HEATING COIL OF AN ELECTRIC HEATER
John W. Moore, Max Meadows, Va., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Nov. 22, 1976, Ser. No. 744,183
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—17



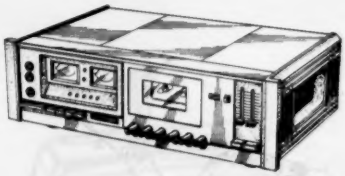
248,465
PLUG FOR MULTICONDUCTOR PATCHING APPARATUS
Charles Louis Roberts, Alexandria, and Jacob Lightsey Wallace, Jr., Springfield, both of Va., assignors to Atlantic Research Corporation, Alexandria, Va.
Filed Jul. 29, 1976, Ser. No. 709,937
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



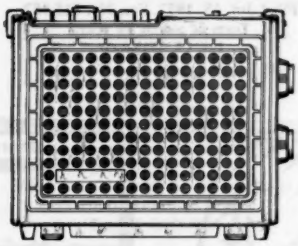
248,466
ANTENNA ROTATOR CONTROL
David D. Tompkins, Columbus, Ohio, assignor to Crown Controls Corporation, New Bremen, Ohio
Division of Ser. No. 661,320, Feb. 25, 1976. This application Aug. 3, 1977, Ser. No. 821,532
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

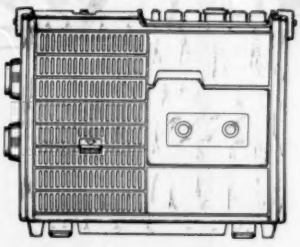


248,467
CASSETTE TAPE DECK
Nobuo Usami, Hatano, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan
Filed May 27, 1976, Ser. No. 690,773
Claims priority, application Japan, Dec. 3, 1975, 50/47492
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D14—6

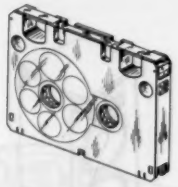


248,468
CASSETTE TAPE RECORDER
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company
Filed Jun. 11, 1976, Ser. No. 695,006
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6





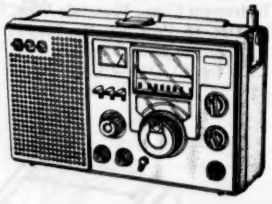
248,469
TAPE CASSETTE
Shigeo Takahashi, Urawa, Japan, assignor to Sony Corporation
Filed May 13, 1976, Ser. No. 686,035
Claims priority, application Japan, Nov. 14, 1975, 50/045126
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—11



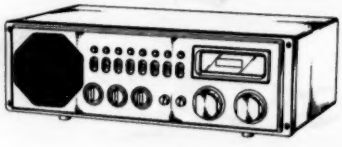
248,470
PLUG-IN CARTRIDGE FOR VIDEO GAME AND THE LIKE
Nicholas F. Talesfore, San Jose, Calif., assignor to Fairchild Camera and Instrument Corp., Mountain View, Calif.
Filed Dec. 13, 1976, Ser. No. 751,357
Term of patent 14 years
Int. Cl. D16—*05, 99*
U.S. Cl. D14—11

248,471
SPEAKER CABINET
Yoshinobu Asai, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Nov. 4, 1976, Ser. No. 738,972
Claims priority, application Japan, May 20, 1976, 51/18710
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34

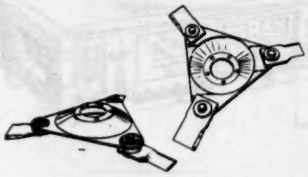
248,472
RADIO RECEIVER
Takeyoshi Kawano, Kyoto, and Kikuo Ohta, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Aug. 18, 1976, Ser. No. 715,595
Claims priority, application Japan, Apr. 15, 1976, 51/13952
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



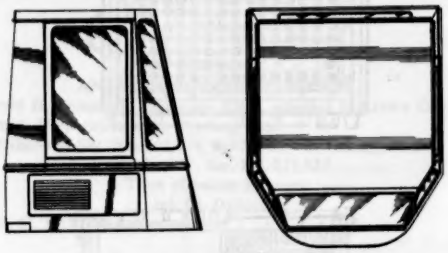
248,473
TRANSCEIVER
Masanori Hamada, Yao, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jun. 16, 1976, Ser. No. 696,653
Claims priority, application Japan, Dec. 26, 1975, 50/52162
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71



248,474
MOWING DISK
Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm B.V., Nieuw-Vennep, Netherlands
Filed Sep. 30, 1976, Ser. No. 728,022
Claims priority, application Netherlands, Apr. 2, 1976, 1406-01
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29



248,475
CAB FOR EARTHMOVING VEHICLE OR THE LIKE
John M. Parks, Peoria; Barry L. Ahrens, Yorkville; William J. Brown, Naperville, and John Molnar, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Jul. 15, 1977, Ser. No. 815,952
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—30



248,476

SUCTION NOZZLE

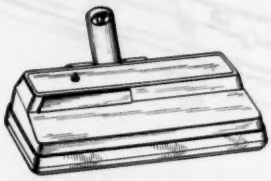
Julian R. Haynes, Hinsdale, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Filed Jul. 12, 1976, Ser. No. 704,161

Term of patent 14 years

Int. Cl. D15—*05*

U.S. Cl. D15—63



248,477

FRAME FOR MAKING MACRAME

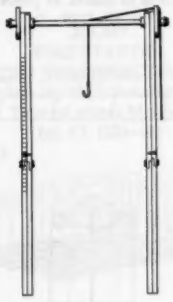
Annie Laurie Morrison, San Diego, Calif., assignor to Morrison Enterprises, San Diego, Calif.

Filed Jun. 24, 1976, Ser. No. 699,647

Term of patent 14 years

Int. Cl. D15—*06*

U.S. Cl. D15—66



248,478

COMBINED AUTOMATIC SEWING MACHINE AND SUPPORTING TABLE

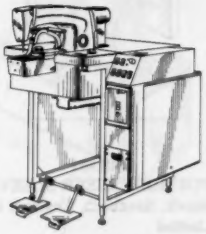
Gerald A. Kraatz, Highland Park, and Robert L. Kosrow, Hoffman Estates, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Aug. 16, 1976, Ser. No. 714,538

Term of patent 14 years

Int. Cl. D15—*06*

U.S. Cl. D15—71



248,479

FOUNDRY RISER SLEEVE

Tony William Bastock, Sandbach, England, assignor to Foseco International Limited

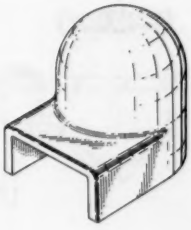
Filed Jun. 13, 1977, Ser. No. 806,165

Claims priority, application United Kingdom, Feb. 3, 1977, 978749/77

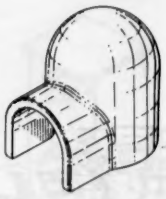
Term of patent 14 years

Int. Cl. D15—*09*

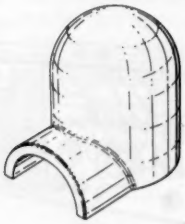
U.S. Cl. D15—135



248,480
FOUNDRY RISER SLEEVE
Tony William Bastock, Sandbach, England, assignor to Foseco International Limited
Filed Sep. 7, 1976, Ser. No. 720,655
Claims priority, application United Kingdom, Mar. 19, 1976, 975098/76
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—135



248,481
FOUNDRY RISER SLEEVE
Tony William Bastock, Sandbach, England, assignor to Foseco International Limited
Filed Jun. 13, 1977, Ser. No. 806,164
Claims priority, application United Kingdom, Feb. 3, 1977, 978748/77
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—135



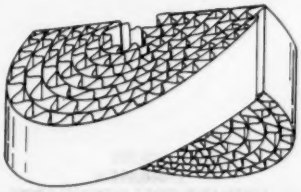
248,482
CHART STRIPPING FINGER
Joseph W. Schaffer, Indianapolis, Ind., assignor to Esterline Augus Instrument Corp.
Filed Apr. 19, 1976, Ser. No. 678,224
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D16—32

248,483
DOCUMENT HANGER
Abram G. Elias, 1527 Greg St., Sparks, Nev. 89431, and Peter G. Elias, 6 Wedgewood Dr., Winnipeg, Manitoba, Canada (R3T 2J8)
Filed Oct. 6, 1975, Ser. No. 619,568
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91

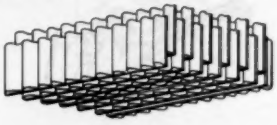
248,484
DOCUMENT HOLDER
Norman Hedstrom, Worcester; David M. Wright, and Jerome O'Toole, both of Shrewsbury, all of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Nov. 12, 1976, Ser. No. 741,226
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—91

248,485
FILTER
Richard Strauss, Lexington, and Philip C. Kimball, Andover, both of Mass., assignors to Whatman Reeve Angel Limited, Maidstone, England
Filed Apr. 18, 1977, Ser. No. 788,352
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

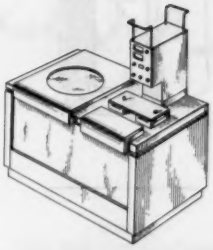
248,486
FIRE STARTER
Robert S. Taylor, 1583 Desoto Way, Livermore, Calif. 94550
Filed Jan. 21, 1977, Ser. No. 761,155
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—90.1



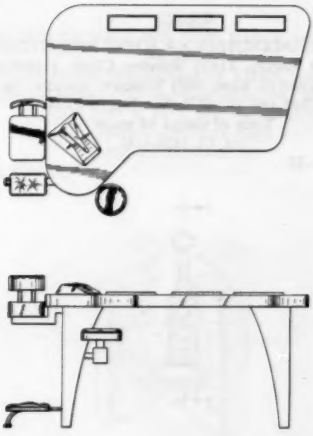
248,487
FIRE STARTER
Robert S. Taylor, 1583 DeSoto Way, Livermore, Calif. 94550
Filed Jan. 21, 1977, Ser. No. 761,156
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—90.1



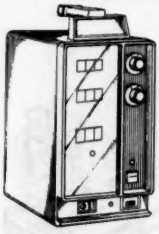
248,488
BLOOD PROCESSING APPARATUS
Daniel Ashcraft, 110 S. Juanita, Redondo Beach, Calif. 90277; James G. Bruni, 736-B Center Pl., Manhattan Beach, Calif. 90266; Stephen G. Hauser, 4133 Aleman Dr., Tarzana, Calif. 91356, and Keith S. Keith, 1419 W. 148th St., Gardena, Calif. 90247
Filed Jul. 16, 1976, Ser. No. 705,983
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1



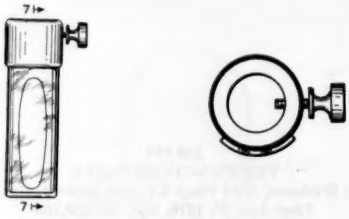
248,489
VENIPUNCTURE TABLE
Ceronnie Robinson, 2794 Pasco La., SE., Atlanta, Ga. 30316
Filed Apr. 27, 1976, Ser. No. 680,764
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—3



248,490
SPHYGMOMANOMETER
Joseph J. Manno, La Jolla, Calif., assignor to IVAC Corporation, La Jolla, Calif.
Filed Oct. 25, 1977, Ser. No. 845,144
Term of patent 14 years
Int. Cl. D14—*01, 99*
U.S. Cl. D24—17

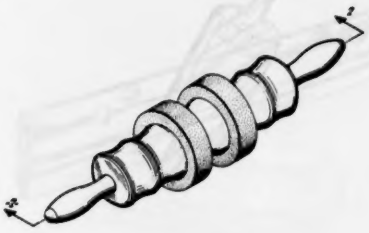


248,491
SYRINGE SHIELD
James M. Reiss, P.O. Box 657, Center Moriches, N.Y. 11934
Filed Apr. 15, 1976, Ser. No. 677,316
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—25

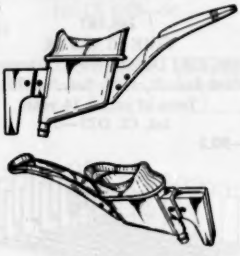


248,492
TEMPOROMANDIBULAR JOINT PROSTHESIS
Charles Albert Homsy, 11526 Raintree Circle, Houston, Tex. 77024, and John N. Kent, 5901 Wheeler, Metaire, La. 70003
Filed Jul. 12, 1976, Ser. No. 704,134
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

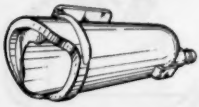
248,493
MASSAGING DEVICE
J. D. Moncrief, 3139 Woodmark Ct., Sacramento, Calif. 95821
Filed Mar. 17, 1976, Ser. No. 667,551
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36

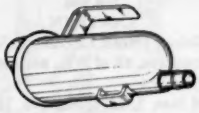


248,494
URINARY COLLECTING UNIT
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kenshun Ishii, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Jun. 4, 1976, Ser. No. 692,709
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—54

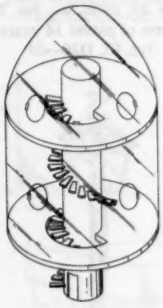


248,495
URINARY COLLECTING UNIT
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kenshun Ishii, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Jun. 4, 1976, Ser. No. 692,710
Claims priority, application Japan, Feb. 19, 1976, 51-5376
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—54



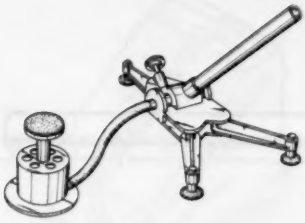


248,496
BUILDING
Samuel Mark, 709 Melville Ave., Baltimore, Md. 21218
Filed Oct. 20, 1976, Ser. No. 734,247
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—5

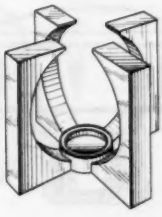


248,497
DISPOSABLE RESPIRATOR
Patrick F. Slosek, Dudley, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed May 20, 1976, Ser. No. 688,507
Term of patent 14 years
Int. Cl. D24—*02, 99;* D29—*02*
U.S. Cl. D29—8

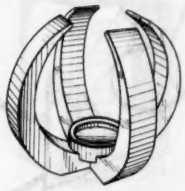
248,498
TOY ROCKET LAUNCHER
Hisao Kambayashi, 1262 Mabashi, Matsudo-shi, Chiba-ken, Japan
Filed Jan. 5, 1976, Ser. No. 646,575
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 PP



248,499
BASE FOR CANDLE HOLDER, LAMP, OR SIMILAR ARTICLE
Raymond M. Ulrich, and Richard M. Ulrich, both of Washington, Ill., assignors to Ulrich Foundation, Inc., Washington, Ill.
Filed Mar. 9, 1977, Ser. No. 775,698
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2

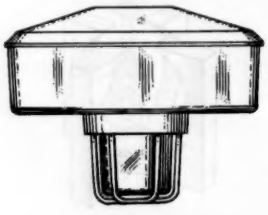


248,500
BASE FOR CANDLE HOLDER, LAMP, OR SIMILAR ARTICLE
Raymond M. Ulrich, and Richard M. Ulrich, both of Washington, Ill., assignors to Ulrich Foundation, Inc., Washington, Ill.
Filed Mar. 9, 1977, Ser. No. 775,703
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2

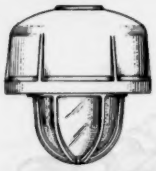


248,501
LAMP UNIT
Elmer G. Fridrich, Chardon, and John M. Davenport, Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Filed May 3, 1976, Ser. No. 682,211
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F

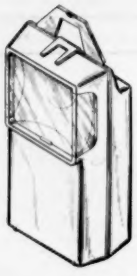
248,502
LUMINAIRE
Clifford M. Laughter, Hendersonville, N.C., assignor to General Electric Company
Filed Jun. 6, 1977, Ser. No. 803,488
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



248,503
LUMINAIRE
James L. Grindle, Hendersonville, N.C., assignor to General Electric Company
Filed Jul. 25, 1977, Ser. No. 818,367
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

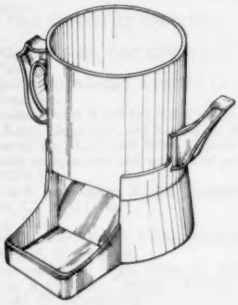


248,504
LANTERN
Nolan Rhoades, Beloit; Daniel C. Oakley, Madison, and Ralph T. Jacobsen, Stoughton, all of Wis., assignors to ESB Incorporated, Philadelphia, Pa.
Filed Nov. 1, 1976, Ser. No. 737,447
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R

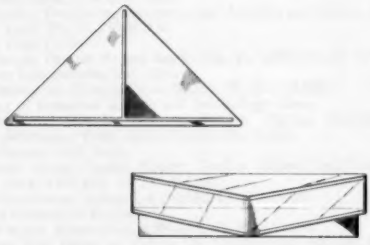


248,505
COMBINED LAMP AND IDENTIFICATION SIGN
Walter Koziol, Russell, Ill., assignor to Beatrice Foods Co., Chicago, Ill.
Filed Sep. 29, 1976, Ser. No. 728,019
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—36

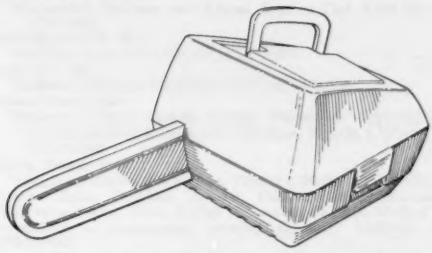
248,506
DISPENSER FOR SWEETS
Amilcare Dogliotti, Neive, Cuneo, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Cuneo, Italy
Filed Mar. 31, 1976, Ser. No. 672,355
Claims priority, application Italy, Oct. 6, 1975, 53390 B/75
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D52—2 B



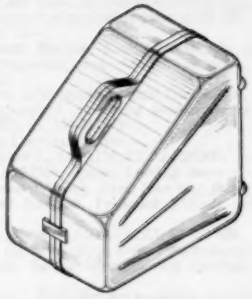
248,507
DISPLAY RECEPTACLE FOR A FOLDED FLAG
John A. Pivec, 3646 Brunswick Ave. N., Crystal, Minn. 55422
Filed Sep. 30, 1976, Ser. No. 728,447
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



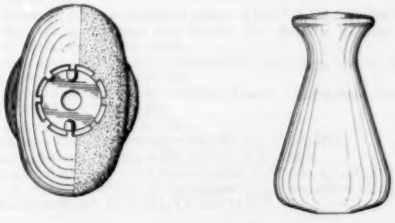
248,508
COMBINED CARRYING AND STORAGE CASE FOR A CHAINSAW
Donald A. Malcolm, Roanoke Rapids, N.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 3, 1976, Ser. No. 747,290
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



248,509
LUGGAGE CASE
Philip Tait, 1088 Avenue Rd., Toronto, Ontario, Canada (M5N 2E2)
Filed Jun. 4, 1976, Ser. No. 693,206
Claims priority, application Canada, Mar. 11, 1976, 1103761
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—5 F



248,510
HAND GRIP FOR PATIENT WALKING AIDS
Fred DiVito, Bronx, N.Y., assignor to Lumex, Inc., Bay Shore, N.Y.
Filed Jul. 16, 1975, Ser. No. 596,297
Term of patent 14 years
Int. Cl. D3—*03;* D24—*99*
U.S. Cl. D88—5



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF JULY, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. & H. Mfg. Co.: *See—*
Feibelman, Jeffrey A., 4,099,611, Cl. 206-45.140.

A. J. Bingley Limited: *See—*
Whittle, Harry Reed; and Ward, Brooke Armitage, 4,099,830, Cl. 350-6.800.

A. L. Gebhardt Company: *See—*
Holloway, Donald Francis, 4,100,154, Cl. 260-123.700.

A/S Niro Atomizer: *See—*
Hansen, Ove; and Rasmussen, Stig, 4,099,982, Cl. 127-61.000.

AB Centralsug: *See—*
Hyden, Hans Olof, 4,099,457, Cl. 100-42.000.

AB Ziristor: *See—*
Gustafsson, Ake; and Stark, Olof, 4,099,914, Cl. 21-57.000.

Abad, Aurelien: *See—*
Yax, Emile; and Abad, Aurelien, 4,100,336, Cl. 526-67.000.

Abbott Laboratories: *See—*
Standley, Wendell Evert, 4,099,674, Cl. 239-431.000.

Abe, Nobuyoshi; Kubo, Shigenaga; and Kanamaru, Kiyoshi, to Nippon Chemical Industrial Co., Ltd.; and Toho Ganryo Kogyo Co., Ltd. Antimony trioxide composition and process of producing the same. 4,100,074, Cl. 252-8.100.

Abel, Frank Bernard, to Eastman Kodak Company. Contamination sensor. 4,099,861, Cl. 355-15.000.

Abendroth, Georg: *See—*
Tippmer, Kurt; Schmitt, Hubert; Vinke, Heinrich; and Abendroth, Georg, 4,099,929, Cl. 44-1.00F.

Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to Ayerst, McKenna & Harrison Limited. 11-Deoxyprostaglandin derivatives. 4,100,343, Cl. 542-426.000.

ACF Industries, Inc.: *See—*
Bickhaus, James T., 4,099,504, Cl. 123-122.0AB.
Casey, Edward H., 4,099,503, Cl. 123-122.0AB.
Lindberg, Allen W.; and Gantzert, Thomas R., 4,100,234, Cl. 261-121.00B.

Acheson Industries, Inc.: *See—*
Heath, Allan B.; and Wolfe, Eugene E., 4,099,673, Cl. 239-415.000.

Acurex Corporation: *See—*
Kendall, Robert M.; and Lapson, William F., 4,099,620, Cl. 209-74.00R.

Ada Pumps, Inc.: *See—*
Ogles, Ethridge F., 4,099,447, Cl. 91-218.000.

Adachi, Yoshio, to Hitachi, Ltd. FET Logic circuit for the detection of a three level input signal including an undetermined open level as one of three levels. 4,100,429, Cl. 307-205.000.

Adams Industries, Inc.: *See—*
Tilp, George E., 4,100,394, Cl. 219-296.000.

Adams, John: *See—*
Stouffer, Richard C.; and Adams, John, 4,099,683, Cl. 242-107.000.

Adams, John Howard, to Chevron Research Company. Greases containing borate dispersions as extreme-pressure additives. 4,100,080, Cl. 252-18.000.

Adams, Terence C., to Birtley Engineering Limited. Manufacture of grading and dewatering screens. 4,100,248, Cl. 264-273.000.

Addressograph Multigraph Corp.: *See—*
Foote, Francis C., 4,100,011, Cl. 156-272.000.
Rubin, Jack C., 4,100,096, Cl. 252-145.000.

Adler, Franklin P., to Pullman Incorporated. Lock for a hopper car outlet gate. 4,099,468, Cl. 105-310.000.

Adler-Nissen, Jens Lorenz, to Novo Industri A/S. Hydrolysis of soy protein. 4,100,024, Cl. 195-29.000.

Adler-Nissen, Jens Lorenz, to Novo Industri A/S. Enzymatic modification of corn gluten. 4,100,151, Cl. 260-112.00G.

Admiral Corporation: *See—*
Arneson, Blayne E., 4,100,578, Cl. 358-191.000.

AEG-Elotherm, G.m.b.H.: *See—*
Reinke, Friedhelm; Mackenberger, Ludwig; and Siefert, Eckhard, 4,100,387, Cl. 219-10.570.

Aepli, Otto T.: *See—*
Garvin, Donald F.; and Aepli, Otto T., 4,099,985, Cl. 134-4.000.

Aerwey Laboratories, Inc.: *See—*
Thornwald, Everett D., 4,100,235, Cl. 261-142.000.

Agency of Industrial Science and Technology: *See—*
Sunahara, Hiroshi; Ishihara, Yutaka; Tanaka, Kazuhiko; and Morimoto, Yuko, 4,099,871, Cl. 356-73.000.

Agfa-Gevaert AG: *See—*
Bickl, Horst; Findeis, Gunter; Treiber, Helmut; and Zahn, Wolfgang, 4,099,862, Cl. 355-35.000.
Wagensonner, Eduard, 4,100,590, Cl. 362-16.000.

AGFA-Gevaert N.V.: *See—*
Wouters, Albert Paul, 4,099,487, Cl. 118-651.000.

Ahonen, Ahti Ilmari, to Valmet Oy. Off-the-road vehicles. 4,099,733, Cl. 280-6.100.

Ahrens, Stephen Carl: *See—*
Khajezadeh, Heshmat; and Ahrens, Stephen Carl, 4,100,565, Cl. 357-51.000.

Air-O-Mulder B.V.: *See—*
van Vliet, Cors, 4,099,749, Cl. 285-398.000.

Airco, Inc.: *See—*
Wallouch, Rudolph W., 4,100,314, Cl. 427-228.000.

Aizawa, Hiroshi: *See—*
Nakamura, Zenzo; Ohtaki, Syohei; Tsunekawa, Tokuichi; Ito, Tadashi; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,100,459, Cl. 315-136.000.

Aizawa, Tatsuo: *See—*
Takayama, Hiroshi; and Aizawa, Tatsuo, 4,100,087, Cl. 252-62.10P.

Akimoto, Taizo; Terashita, Takaaki; Takahashi, Koji; Watanabe, Shigeru; and Asai, Eiichi, to Fuji Photo Film Co., Ltd. Method for controlling a photographic printing exposure. 4,100,424, Cl. 250-559.000.

Akiyoshi, Tsuyoshi; Yamaguchi, Namio; and Yamamoto, Keisuke, to Matsushita Electric Industrial Co., Ltd. Ghost cancellation device. 4,100,496, Cl. 325-369.000.

Aktiebolaget Atomenergi: *See—*
Margen, Peter Heinrich Erwin; Bosaeus, Jan Anders; and Skarud, Bengt Olof Roland, 4,099,555, Cl. 165-55.000.

Aktiebolaget Carl Munters: *See—*
Norback, Per S., 4,099,928, Cl. 29-157.30D.

Aktiebolaget Karlstads Mekaniska Werkstad: *See—*
Wahren, Douglas; Stenberg, Erik Gunnar; and Klerelid, Berndt Erik Ingvar, 4,100,018, Cl. 162-203.000.

Aktiebolaget Svenska Flaktfabriken: *See—*
Gustavsson, Lennart, 4,099,296, Cl. 19-304.000.

Akune, Ikuo: *See—*
Narui, Hiroshi; Akune, Ikuo; and Kobiki, Yosiya, 4,100,317, Cl. 428-137.000.

Alafandi, Hamid; and Stamires, Dennis, to Filtrol Corporation. Zeolitic catalysts and method of producing same. 4,100,108, Cl. 252-455.00Z.

Alberts, Heinrich: *See—*
Hess, Bernhard; Raichle, Karl; Bottenbruch, Ludwig; Schulz-Walz, Hansjochen; and Alberts, Heinrich, 4,100,224, Cl. 260-862.000.

Albright, James A., to Velsicol Chemical Corporation. Intumescent fire retardant compositions containing pentaerythritol cyclic diphosphates. 4,099,975, Cl. 106-15.0FP.

Alcan Aluminum Corporation: *See—*
Graham, Hubert P., 4,099,356, Cl. 52-520.000.

Alcan Research and Development Limited: *See—*
Dewing, Ernest William; Huni, Jean-Paul Robert; Sood, Raman Radha; and Southam, Frederick William, 4,099,959, Cl. 75-10.00R.
Hardouin, Jean Pierre, 4,099,434, Cl. 83-157.000.

Alcock, Richard A.; and Guthrie, Robert M., to Rockford Manufacturing Group, Inc. In-line wire drawing machine. 4,099,403, Cl. 72-288.000.

Alenares, Santiago S. Hydrotherapy apparatus and method for exercising the veins of the leg and foot. 4,099,522, Cl. 128-66.000.

Alexander, Charles F., Jr., to Brunswick Corporation. High thrust trolling motor. 4,099,478, Cl. 115-18.00E.

Alexander, Robert W., to Armalite, Inc. Method for producing ice. 4,099,946, Cl. 62-73.000.

Alfredsson, Bengt Agne: *See—*
Reinhardt, Nils; Kuylenstierna, Ulf Vilhelm; and Alfredsson, Bengt Agne, 4,100,251, Cl. 423-63.000.

Allegheny Ludlum Industries, Inc.: *See—*
Chivinsky, Joseph A.; and Deverell, Harry E., 4,099,966, Cl. 75-125.000.

Allen-Bradley Company: *See—*
Denes, Oscar L., 4,100,525, Cl. 338-195.000.
Nelson, Terrance D.; and Klippel, Bruce G., 4,100,469, Cl. 318-227.000.

Allen, Elbert F. Bicycle accessory means. 4,099,738, Cl. 280-289.00D.

Allen, Herbert, to Cameron Iron Works, Inc. Annular blowout preventer. 4,099,699, Cl. 251-1.00B.

Allen, Joseph C., to Texaco Inc. Method for recovering viscous petroleum. 4,099,568, Cl. 166-269.000.

Allen, Terry Mark; and Derfler, William Duane. Lightweight costume head. 4,099,271, Cl. 2-192.000.

Allied Chemical Corporation: *See—*
Anderson, George Bernard, 4,099,707, Cl. 254-35.000.
Mears, Whitney Harris, 4,100,366, Cl. 174-15.00R.
Stouffer, Richard C.; and Adams, John, 4,099,683, Cl. 242-107.000.

Allington, Robert William, to Instrumentation Specialties Company. Chemical analyzer. 4,099,921, Cl. 23-253.00R.

Almgren, Bertil: *See*—
Elmqvist, Rune; and Almgren, Bertil, 4,100,550, Cl. 346-140.00R.

Alsup, James M.; and Whitehouse, Harper J., to United States of America, Navy. Discrete chirp frequency synthesizer. 4,100,498, Cl. 328-14.000.

Aluminum Company of America: *See*—
Bennett, Robert F.; Brouwer, Nicholaas L.; and Stricker, David M., 4,099,418, Cl. 73-622.000.

Amada, Nobutaka: *See*—
Nakagaki, Harushige; Sampei, Tohru; Amada, Nobutaka; and Baba, Tatsuo, 4,100,501, Cl. 330-263.000.

Amadio, Clive Lyof. Corrective device for clarinets. 4,099,442, Cl. 84-382.000.

Amano, Hisao: *See*—
Iyotani, Ryuji; Watanabe, Atsumi; Amano, Hisao; and Ogata, Fumio, 4,100,434, Cl. 307-252.00L.

Amax Inc.: *See*—
Chou, Eddie C.; Queneau, Paul B.; Laferty, John M.; and Carlberg, John R., 4,100,043, Cl. 204-108.000.

Amerace Corporation: *See*—
Mazzeo, Charles F.; and Waddington, William T., 4,099,826, Cl. 339-198.00R.

America Pacemaker Corporation: *See*—
Chen, Chieh Y.; and Grace, Wesley R., 4,099,530, Cl. 128-419.0PT.

American Air Filter Company, Inc.: *See*—
Onnen, James H., 4,099,938, Cl. 55-230.000.

American Can Company: *See*—
Schlesinger, Sheldon Irwin; and Boszak, Ronald J., 4,100,321, Cl. 428-207.000.

American Carrier Equipment, Inc.: *See*—
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,099,741, Cl. 280-712.000.

American Cyanamid Company: *See*—
Giglia, Robert Domenico, 4,099,839, Cl. 350-357.000.

American Home Products Corporation: *See*—
Demerson, Christopher A.; and Humber, Leslie G., 4,100,277, Cl. 424-244.000.
Garsky, Victor M., 4,100,153, Cl. 260-112.50S.

American Induction Heating Corporation: *See*—
Duca, William J., 4,100,365, Cl. 13-27.000.

American Screen Printing: *See*—
Bubley, Henry J.; Oltra, Claude H.; and Krutsch, John R., 4,099,460, Cl. 101-44.000.

American Seating Company: *See*—
Barecki, Chester J., 4,099,772, Cl. 297-220.000.

Ames Rubber Corporation: *See*—
Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., 4,099,312, Cl. 29-130.000.

AMF Incorporated: *See*—
Caplan, David M., 4,099,715, Cl. 273-63.00E.
Peterson, Clifford D., 4,099,366, Cl. 56-13.600.

Amos, James. Convertible seat-bed unit. 4,099,768, Cl. 297-63.000.

AMP, Incorporated: *See*—
Lemke, Timothy Allen; and Shultz, Edmond Franklin, Jr., 4,099,615, Cl. 206-329.000.
Morgan, Joe Pierce; Phillips, Howard Charles; and Spong, Richard Vernon, 4,099,316, Cl. 29-566.200.
Webster, Van Keith, 4,099,827, Cl. 339-228.000.

Analytical Measurements, Inc.: *See*—
Andrews, Elmer, 4,100,470, Cl. 318-466.000.

Anderson, George Bernard, to Allied Chemical Corporation. Vehicle moving apparatus. 4,099,707, Cl. 254-35.000.

Anderson, Glenn W.: *See*—
Hutchison, Stanley O.; and Anderson, Glenn W., 4,099,563, Cl. 166-191.000.

Anderson, Ingvar G.: *See*—
Mackenzie, Harold B.; and Anderson, Ingvar G., 4,099,473, Cl. 110-219.000.

Anderson, Keith J. Releasable magnet assembly. 4,099,755, Cl. 292-251.500.

Anderson, Oscar L.: *See*—
Peterson, Wallace W.; and Anderson, Oscar L., 4,099,331, Cl. 33-88.000.

Anderson, Ralph F., to B. F. Goodrich Company, The. Flexible cover for a chlorine cell. 4,100,053, Cl. 204-279.000.

Anderson, Richard A.; Sokolowski, Robert C.; and Ostermeier, Kurt W., to Kimberly-Clark Corporation. Nonwoven fabric and method of producing same. 4,100,324, Cl. 428-288.000.

Anderson, Thomas E.; Peak, Steven C.; and Ibsen, Ole N., to General Electric Company. Circuit for detecting the flow of an excess of reverse power from a load to a power system. 4,100,587, Cl. 361-82.000.

Anderson, Wallace F.: *See*—
Schwee, Leonard J.; Irons, Henry R.; Anderson, Wallace F.; Scharnhorst, Kurt Peter; and Krall, Albert D., 4,100,609, Cl. 365-87.000.

Andersson, Clarence A.: *See*—
Lange, Frederick F.; and Andersson, Clarence A., 4,099,979, Cl. 106-58.000.

Andren, Lars-Goran Hjalmar; Bjorkman, Rune Harald; Easterday, Richard Lee; and Munktell, Hans Gosta, to Pharmacia Fine Chemicals AB. Apparatus for optically analyzing fluids. 4,099,882, Cl. 356-181.000.

Andrews, Elmer, to Analytical Measurements, Inc. Precision drive system for a chart recorder. 4,100,470, Cl. 318-466.000.

Andrews, Mena G., to Combustion Engineering, Inc. Internal fuel pin oxidizer. 4,100,020, Cl. 176-68.000.

Angelier, Nicole: *See*—
Boulenger, Paul; Angelier, Nicole; and Torres, Jean-Pierre, 4,100,062, Cl. 210-14.000.

Anic, S.p.A.: *See*—
Romano, Ugo; and Tesei, Renato, 4,100,351, Cl. 560-24.000.

Ansari, Hifzur Rahman; Unwin, Neville; and Wagner, Horst Richard, to Bush Boake Allen Limited. Isolongifolene Prins reaction compounds in perfumery. 4,100,110, Cl. 252-522.000.

Antolino, Angelo, to New Colony Inventions, Inc. Selective dispensing utensil. 4,099,654, Cl. 222-184.000.

Aoki, Keiji: *See*—
Yasuda, Eturo; Sato, Susumu; Segawa, Yoshihiro; Hattori, Tadashi; and Aoki, Keiji, 4,099,922, Cl. 23-254.00E.

Aoyagi, Yoshiaki: *See*—
Murai, Hiromu; and Aoyagi, Yoshiaki, 4,100,285, Cl. 424-250.000.

Arcstart, Inc.: *See*—
Jackson, George Robert, 4,100,390, Cl. 219-74.000.

Argosystems, Inc.: *See*—
Lee, Robert Wilton, 4,099,878, Cl. 356-128.000.

Arikawa, Hiroo; and Maruo, Masaya, to San-O Industrial Co., Ltd. Time-lag fuse. 4,100,523, Cl. 337-163.000.

Arimitsu, Tetsuya, to Sanshin Kogyo Kabushiki Kaisha; and Yamaha Hatsudoki Kabushiki Kaisha. Outboard marine propulsion unit. 4,099,479, Cl. 115-41.00R.

Armalite, Inc.: *See*—
Alexander, Robert W., 4,099,946, Cl. 62-73.000.

Armco Steel Corporation: *See*—
Schumacher, William J.; and Tanczyn, Harry, 4,099,967, Cl. 75-128.00A.

Armstrong Cork Company: *See*—
Baer, Steven R., 4,100,115, Cl. 521-83.000.
Herweh, John E., 4,099,910, Cl. 8-115.500.

Arneson, Blayne E., to Admiral Corporation. AFT summing circuit for varactor-type tuning systems. 4,100,578, Cl. 358-191.000.

Aryamane, Avinash: *See*—
Schmidt, John, Jr.; and Aryamane, Avinash, 4,099,320, Cl. 29-623.000.

Aryamane, Avinash P., to Littelfuse, Inc. Method of making a miniature plug-in fuse. 4,099,321, Cl. 29-623.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Masahiro; and Tano, Eiichi, 4,099,885, Cl. 356-223.000.

Asai, Eiichi: *See*—
Akimoto, Taizo; Terashita, Takaaki; Takahashi, Koji; Watanabe, Shigeru; and Asai, Eiichi, 4,100,424, Cl. 250-559.000.

Asaka, Urataro, to Honda Giken Kogyo Kabushiki Kaisha. Mixture correction system during rapid acceleration in internal combustion engine with auxiliary combustion chamber. 4,099,492, Cl. 123-32.0ST.

Asakawa, Takeki: *See*—
Koike, Hiroshi; Suzuki, Shoji; and Asakawa, Takeki, 4,100,558, Cl. 354-271.000.

Asano, Hiroaki, to Toyoda Koki Kabushiki-Kaisha. Cam grinding machine with swing table support device. 4,099,349, Cl. 51-101.00R.

Asano, Teryoshi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Device for producing a pipe joint having an internal groove therein. 4,100,307, Cl. 425-533.000.

ASEA Aktiebolag: *See*—
Kollberg, Sten, 4,100,364, Cl. 13-9.00R.

Ashman, John Slocum; and Mudrak, Anton, to Harshaw Chemical Company, The. Silane treated antimony compounds. 4,100,075, Cl. 252-8.100.

Ashman, John Slocum; Burt, Gerald Dennis; and Mudrak, Anton, to Harshaw Chemical Company, The. Titanate treated antimony compounds. 4,100,076, Cl. 252-8.100.

Ashorn, Theodore Heinrich Gustave; and Laine, Paul Elis, to G. A. Serlachius Oy. Method of condensing and/or polymerizing sulfonated lignin containing materials. 4,100,155, Cl. 260-124.00R.

Askew, James Martin Anderton, to Lucas Industries Limited. Structure facilitating fuel pump assembling. 4,099,895, Cl. 417-499.000.

Askew, William, to Dresser Europe, S.A. Mining machine. 4,099,787, Cl. 299-43.000.

Asperger, Robert G.; and Clouse, Robert C., to Dow Chemical Company, The. Quaternary salt-polyamine inhibitor for sour gas conditioning solutions. 4,100,099, Cl. 252-189.000.

Asperger, Robert G.: *See*—
Clouse, Robert C.; and Asperger, Robert G., 4,100,100, Cl. 252-189.000.

Associated Paper Industries Limited: *See*—
Singh, Tej Kuldip, 4,099,342, Cl. 36-44.000.

Atari Inc.: *See*—
Dean, David W.; and Bristow, Stephen D., 4,099,719, Cl. 273-101.200.

Atherton, Frank Ratcliffe; Hall, Michael John; Hassall, Cedric Herbert; Ringrose, Peter Stuart; and Lambert, Robert Wilson, to Hoffmann-La Roche Inc. Compositions having antibiotic properties. 4,100,275, Cl. 424-211.000.

Atlantic Richfield Company: *See*—
Burger, Edward D., 4,099,622, Cl. 209-114.000.

Aubailly-Delalieu, Marc M., to Societe Anonyme Eau-Gaz-Assainissement. Endless power-driven conveyor with discharge comb. 4,099,610, Cl. 198-729.000.

Automation Industries, Inc.: *See*—
Kutnyak, Thomas A.; and Dunn, George T., 4,099,744, Cl. 285-7.000.

Automatisme & Technique: *See*—
Bardet, Gerard, 4,100,386, Cl. 219-10.55M.

Automotive Products Limited: *See*—
Higgerson, Raymond, 4,099,604, Cl. 192-111.00A.
Temperley, Harry Davison; and Parsons, David, 4,099,600, Cl. 188-73.400.

Ayerst, McKenna & Harrison Limited: *See*—
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,100,343, Cl. 542-426.000.

B. Braun Instruments: *See*—
Pudenz, Alfred, 4,099,315, Cl. 29-434.000.

B. F. Goodrich Company, The: *See*—
Anderson, Ralph F., 4,100,053, Cl. 204-279.000.
Summers, James William; and Kliner, George Joseph, 4,100,325, Cl. 428-334.000.

Baba, Tatsuo: *See*—
Nakagaki, Harushige; Sampei, Tohru; Amada, Nobutaka; and Baba, Tatsuo, 4,100,501, Cl. 330-263.000.

Bacskai, Robert, to Chevron Research Company. Phosphonium catalyst system for the polymerization of 2-pyrrolidone. 4,100,146, Cl. 528-313.000.

Baelde, Claude: *See*—
Rondeaux, Louis; Legrand, Jules; and Baelde, Claude, 4,099,953, Cl. 65-335.000.

Baer, Steven R., to Armstrong Cork Company. High-temperature insulation composite molded product. 4,100,115, Cl. 521-83.000.

Bager, Reinhard, to Saurer-Allma GmbH. Programmed control for effect spinning and twisting machines. 4,100,399, Cl. 235-92.0CC.

Baggett, Joseph McClendon; and Krause, Ruben Louis, to Dow Chemical Company, The. Polycarbonates incorporating epihalohydrin residues. 4,100,139, Cl. 528-196.000.

Bagli, Jehan F.: *See*—
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,100,343, Cl. 542-426.000.

Bahnfleth, William A.: *See*—
Maier, Roger F.; Milligan, Jimmy L.; Bahnfleth, William A.; and Taylor, James L., 4,099,763, Cl. 296-28.00C.

Bailey, Terry R.: *See*—
Cook, Jack E.; and Bailey, Terry R., 4,099,838, Cl. 350-105.000.

Baker, Dennis Stanley; and Davies, Glyndwr John, to Glacier Metal Company, Limited, The. Plain bearings. 4,099,804, Cl. 308-237.00R.

Baker, Howard Burgess, to General Electric Company Limited, The. Machines for inserting electric circuit components on printed circuit boards. 4,099,325, Cl. 29-741.000.

Balcke-Durr AG: *See*—
Fickelscher, Kurt Gerhard, 4,099,427, Cl. 74-804.000.
Wohler, Hans-Joachim; and Ilse, Walter, 4,099,675, Cl. 239-498.000.

Baldwin, David E., Jr.: *See*—
Sheely, Clyde Q., Jr.; and Baldwin, David E., Jr., 4,099,565, Cl. 166-252.000.

Ball, Thomas S.; and Rugh, John D., to Ball, Thomas S. Bio-alarm security system. 4,100,536, Cl. 340-207.00R.

Ballard, Jules, to Glenro, Inc. Expanded element radiant heating device. 4,100,395, Cl. 219-356.000.

Ballweber, Edward G.: *See*—
Selvarajan, Radhakrishnan; and Ballweber, Edward G., 4,100,167, Cl. 260-296.00R.
Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., 4,100,231, Cl. 260-978.000.

Banninga, Edward P.: *See*—
Wistinghausen, Nikolai K.; and Banninga, Edward P., 4,099,363, Cl. 53-124.00D.

Baranowski, Stephen W.; and McConeghy, Richard H., to Square D Company. Load controlling means. 4,100,426, Cl. 307-41.000.

Barch, Herbert W.; and Bohy, August G., to PPG Industries, Inc. Apparatus for producing slubby yarn. 4,099,307, Cl. 28-252.000.

Bardet, Gerard, to Automatisme & Technique; and Desmarquest Et C.E.C. Process for sintering ceramic products. 4,100,386, Cl. 219-10.55M.

Barecki, Chester J., to American Seating Company. Seat rack with a replaceable head rest cover. 4,099,772, Cl. 297-220.000.

Barnes, John A., to R. Ritter Corporation. Airborne pulse magnetron and power supply system. 4,099,807, Cl. 315-127.000.

Baron, William James; and Kenney, John Thomas, to Western Electric Company, Inc. Method of depositing a metal on a surface. 4,100,037, Cl. 204-15.000.

Barron, Ellis. Plectrum piano action. 4,099,440, Cl. 84-258.000.

Barry, Fentress S. Bench for potting of plants and the like. 4,099,811, Cl. 312-211.000.

Barry, John Kenneth: *See*—
Nash, Myrwin William; Barry, John Kenneth; and Wiatt, James Gordon, 4,099,905, Cl. 425-589.000.

Bartholomew, Roger F.; and Wu, Che-Kuang, to Corning Glass Works. High refractive index hydrated glasses. 4,099,978, Cl. 106-53.000.

BASF Aktiengesellschaft: *See*—
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,100,191, Cl. 260-557.00R.
Jaedicke, Hagen; Paust, Joachim; and Schneider, Joachim, 4,100,197, Cl. 260-586.00P.
Weitz, Hans-Martin; and Hartig, Juergen, 4,100,361, Cl. 560-244.000.

BASF Wyandotte Corporation: *See*—
Gallagher, James A., 4,100,328, Cl. 428-407.000.
Garvin, Donald F.; and Aepli, Otto T., 4,099,985, Cl. 134-4.000.

Bassani, Giovanni, to Dow Corning Corporation. Liquid polymer extrusion process and product. 4,100,240, Cl. 264-108.000.

Bassani Ticino S.p.A.: *See*—
Rodolfi, Giorgio, 4,100,517, Cl. 335-132.000.

Bauer, Dieter: *See*—
Fischler, Hans-Michael; Bauer, Dieter; and Quast, Hein, 4,100,195, Cl. 260-576.000.

Baues, Peter; and Plaettner, Rolf, to Siemens Aktiengesellschaft. Optical control device for integrated optical circuit. 4,099,836, Cl. 350-96.140.

Baum, Werner: *See*—
Frankle, Helmut; and Baum, Werner, 4,099,584, Cl. 175-14.000.

Baxter Travenol Laboratories, Inc.: *See*—
Heiss, Louis Robert, 4,099,920, Cl. 23-253.00R.

Bayer Aktiengesellschaft: *See*—
Breer, Karl, 4,099,652, Cl. 222-135.000.
Dunwald, Willi; Lewalter, Jurgen; Merten, Rudolf; and Muller, Hans-Jurgen, 4,100,144, Cl. 260-860.000.
Fischler, Hans-Michael; Bauer, Dieter; and Quast, Hein, 4,100,195, Cl. 260-576.000.
Freitag, Dieter; and Nouvertne, Werner, 4,100,130, Cl. 260-37.0PC.
Hess, Bernhard; Raichle, Karl; Bottenbruch, Ludwig; Schulz-Walz, Hansjochen; and Alberts, Heinrich, 4,100,224, Cl. 260-862.000.
Hoppe, Peter; Leyer, Helmut; and Muller, Johann, 4,099,280, Cl. 9-6.00P.
Konig, Joachim; Suling, Carlhans; and Boehmke, Gunther, 4,100,339, Cl. 526-193.000.
Mazanek, Jan; Blahak, Johannes; Wagner, Kuno; and Ziemann, Heinz, 4,100,116, Cl. 521-167.000.
Meyer, Rolf-Volker; and Dhein, Rolf, 4,100,223, Cl. 260-857.00L.
Walther, Herbert; Hartig, Wolfgang; Friedrich, Adolf; and Raue, Roderich, 4,100,509, Cl. 331-94.50L.
Wolf, Gerhard Dieter; Schnoor, Werner; Voegele, Jean-Claude; Reinehr, Ulrich; and Nischk, Gunther, 4,100,143, Cl. 526-301.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Elsholz, Joachim; Bortfeld, Manfred; Maertz, Josef; and Poser, Erhard, 4,099,770, Cl. 297-216.000.
Lehr, Werner, 4,099,778, Cl. 297-386.000.
Muth, Hans-Albrecht; Reissig, Dirk; and Marwitz, Hans-Gunther v.d., 4,099,645, Cl. 220-304.000.

Bayliff, Raymond William, to Decca Limited. Loudspeaker system with phase difference compensation. 4,100,371, Cl. 179-1.00E.

Baylis, Shelby M.; and Szauer, Jorge S. Biopsy apparatus. 4,099,518, Cl. 128-2.00B.

BBC Brown, Boveri & Company, Ltd.: *See*—
Menth, Anton; Nagel, Hartmut; and Perry, Antony James, 4,099,995, Cl. 148-101.000.

Beatrice Foods Company: *See*—
Pezzuto, Michael, Jr., 4,100,125, Cl. 260-29.6TA.

Beck, Arnold, to Buttner-Schilde-Haas Aktiengesellschaft. Arrangement for and method of inserting a nozzle unit into an opening of a spinning device. 4,099,898, Cl. 425-192.00S.

Beck, Don D. Pipe handling apparatus. 4,099,630, Cl. 214-2.500.

Becker, Frederick R., III, to Metropolitan Wire Corporation. Convertible cart. 4,099,735, Cl. 280-79.300.

Becker, Robert J.: *See*—
Cueman, Glenn F.; and Becker, Robert J., 4,099,524, Cl. 128-78.000.

Beckham, Joel M.; Easterling, Gene B.; Ringel, Reginald K.; and Wolff, Egon E., to Caterpillar Tractor Co. Work vehicle and ring gear bearing arrangement therefor. 4,099,577, Cl. 172-781.000.

Beckmann, Martin Josef; and Swann, Ferris George. Low pressure gas burner. 4,099,908, Cl. 431-284.000.

Beers, Melvin D., to General Electric Company. Curable compositions and process. 4,100,129, Cl. 260-37.0SB.

Beguin, Jean Claude; and Guerit, Pierre, to Servimetal. Method of using MgCl.-KCl flux for purification of an aluminum alloy preparation. 4,099,965, Cl. 75-68.00R.

Behr, Michael Isaac; Gyi, KoKo; and Brutsch, Werner, to Burroughs Corporation. Transducer head with narrow core structure. 4,100,584, Cl. 360-125.000.

Belanger, Jean-Yves: *See*—
Sterling, Thomas S.; Belanger, Jean-Yves; and Kalman, Kenneth S., 4,100,000, Cl. 149-4.000.

Bell, Charles M.: *See*—
Hamlett, Sidney J.; and Bell, Charles M., 4,099,474, Cl. 112-258.000.

Bell, Frederick Koonce; and Tuss, John Joseph, to Bendix Corporation, The. Coordinate measuring machine having auxiliary air bearing. 4,099,800, Cl. 308-6.00R.

Bell, George Robert: *See*—
Oakley, Ervin Carvis; Bell, George Robert; and Poole, William Eugene, 4,099,808, Cl. 312-138.00R.

Bell, Henry O. Apparatus and method for hanging and orienting a wall hanging. 4,099,698, Cl. 248-493.000.

Bell & Howell Company: *See*—
Lang, John W., Jr., 4,099,869, Cl. 355-108.000.

Bell, Leo A., to Martin-Decker Company, a division of Gardner-Denver. Drilling fluid compensation device. 4,099,582, Cl. 175-5.000.

Bell Telephone Laboratories, Incorporated: *See*—
Carlisle, Arthur Wallace; and Frey, Dean Rudisill, 4,099,822, Cl. 339-98.000.
Cho, Alfred Yi; and Tsang, Won-Tien, 4,099,305, Cl. 29-579.000.
D'Alessio, Alfonso Joseph, 4,099,823, Cl. 339-113.00B.

Flanagan, James Loton, 4,100,377, Cl. 179-15.0AS.
French, William George; and MacChesney, John Burnette, 4,099,835, Cl. 350-96.300.
Jayant, Nuggehally Sampath; and Kak, Subhash Chandra, 4,100,374, Cl. 179-1.50S.
Napolitano, Orlando; Reid, Robert Edward; Saltzberg, Burton R.; Stochel, Nathan Harold; and Tingley, John Ronald, 4,100,533, Cl. 340-147.00R.
Vazirani, Hargovind Nihchaldas, 4,099,837, Cl. 350-96.290.
Warner, Arthur Woodward, Jr., 4,099,832, Cl. 350-96.210.

Belt, Kenneth W.; and McCarrell, Stuart G., to Macan Engineering & Manufacturing Company, Inc. Variable crest factor high frequency generator apparatus. 4,100,505, Cl. 331-71.000.

Belyshev, Leonid Lavrentievich; Gorokhov, Veniamin Ivanovich; and Chuvpilo, Albert Vladimirovich. Device for application of paste to internal surface of cylindrical electrode of primary cell. 4,099,549, Cl. 141-32.000.

Ben-Gurion University of the Negev Research and Development Authority: *See—*
Krichevsky, Mendel, 4,100,520, Cl. 336-30.000.

Benckiser-Knapsack GmbH.: *See—*
Sommer, Klaus; and Raab, Guenter, 4,100,067, Cl. 210-58.000.

Bender, Ulrich, to Emil Bender, Firma. Manufacture of grids. 4,099,309, Cl. 29-2.000.

Benditalia S.p.A.: *See—*
Cadeddu, Leonardo, 4,099,380, Cl. 60-588.000.

Bendix Corporation, The: *See—*
Bell, Frederick Koonce; and Tuss, John Joseph, 4,099,800, Cl. 308-6.00R.
Bouvier, Alfred Joseph, 4,099,323, Cl. 29-629.000.
Edmond, James Junior, 4,099,409, Cl. 73-133.00R.
Hall, Roger D., 4,100,516, Cl. 333-6.000.
Reddy, Junuthula Nirdosh, 4,099,491, Cl. 123-32.0EE.

Beneteau, Donald Joseph. Apparatus for piercing sheet material. 4,099,436, Cl. 83-617.000.

Bennett, Robert F.; Brouwer, Nicholaas L.; and Stricker, David M., to Aluminum Company of America. System for determining tube eccentricity. 4,099,418, Cl. 73-622.000.

Benson, William A.: *See—*
Kirilloff, Victor V.; and Benson, William A., 4,100,526, Cl. 338-279.000.

Benuska, Alfred L., to V.I.P. Engineered Products Corporation. Automatic web winder. 4,099,682, Cl. 242-56.00R.

Berg, Rudolph G.; and Hetzel, Donald S., to Pfizer Inc. Preparation of citraconic anhydride. 4,100,179, Cl. 260-346.750.

Berg, Stig Ove; and Persson, Rolf Tore, to C J Wennberg AB. Arrangement for withdrawing material from a silo. 4,099,632, Cl. 214-17.0DA.

Berger, Abraham William; and Stubbs, Harry Eugene. Sulfur detecting apparatus comprising holmium, and erbium filters. 4,099,883, Cl. 356-187.000.

Berger, J. Louis. Thermal imaging transducer and system. 4,100,573, Cl. 358-113.000.

Berger, Leopold Benjamin. Solenoid-controlled diaphragm valves. 4,099,701, Cl. 251-30.000.

Bergh Bros. Co., Inc.: *See—*
Bergh, George G.; and Bergh, Robert G., 4,099,647, Cl. 220-334.000.

Bergh, George G.; and Bergh, Robert G., to Bergh Bros. Co., Inc. Hinge mounting means. 4,099,647, Cl. 220-334.000.

Bergh, Robert G.: *See—*
Bergh, George G.; and Bergh, Robert G., 4,099,647, C.. 220-334.000.

Bergstein Packaging Trust, The: *See—*
Bergstein, Robert M., 4,099,665, Cl. 220-403.000.

Bergstein, Robert M., to Bergstein Packaging Trust, The. Reclosable carton with tapered top closure. 4,099,665, Cl. 220-403.000.

Berkman, Samuel; Duffy, Michel Thomas; Kim, Kyong-Min; and Cullen, Glenn Wherry, to RCA Corporation. Apparatus improvements for growing single crystalline silicon sheets. 4,099,924, Cl. 23-273.0SP.

Berkman, Vitaly Iosifovich: *See—*
Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Schedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich, 4,099,334, Cl. 33-346.000.

Berliner, Wallace H.: *See—*
Millheiser, Melvin; and Berliner, Wallace H., 4,099,444, Cl. 85-8.800.

Bernard, James I.; and Strom, Gerald A., to Schlumberger Technology Corporation. Measuring-while-drilling method and system having a digital motor control. 4,100,528, Cl. 340-18.0LD.

Berry, Milton E.; and Cofer, Daniel B., to Southwire Company. Method and apparatus for production of hot-formed metallic rod. 4,099,399, Cl. 72-38.000.

Berstermann, Wilhelm: *See—*
Grisar, Ulrich; and Berstermann, Wilhelm, 4,099,873, Cl. 356-86.000.

Bertele, Ludwig. Variable focal lens having a divergent front element. 4,099,844, Cl. 350-184.000.

Besocke, Karl Heinz, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Electrically driven oscillating capacitor device. 4,100,442, Cl. 310-317.000.

Betensky, Ellis I.: *See—*
Lawson, John A.; and Betensky, Ellis I., 4,099,849, Cl. 350-214.000.

Bethlehem Steel Corporation: *See—*
MacRae, Donald R.; Gold, Richard G.; Sandall, William R.; and Thompson, Charles D., 4,099,958, Cl. 75-0.5BA.

Beurer, Peter; Luthi, Johannes; and Portaleoni, Libero, to Sulzer Brothers Limited. Apparatus for the treatment of liquids. 4,100,071, Cl. 210-197.000.

Beyers, Billy Wesley, Jr., to RCA Corporation. Timekeeping apparatus with power line dropout provisions. 4,099,372, Cl. 58-85.500.

BF Goodrich Company, The: *See—*
Japs, Archie B., 4,099,376, Cl. 60-253.000.
Magistro, Angelo Joseph, 4,100,211, Cl. 260-656.00R.

Bialorucki, Edward J.; Bradley, Ronald W.; and Carl, David G., to Owens-Illinois, Inc. Electrostatically coating hollow glass articles. 4,099,486, Cl. 118-635.000.

Bianchi, Valerio: *See—*
Latsch, Reinard; and Bianchi, Valerio, 4,099,493, Cl. 123-32.0EA.

Bickhaus, James T., to ACF Industries, Inc. Throttle structure for an internal combustion engine. 4,099,504, Cl. 123-122.0AB.

Bickl, Horst; Findeis, Gunter; Treiber, Helmut; and Zahn, Wolfgang, to Agfa-Gevaert AG. Method and apparatus for evaluating developed photographic films preparatory to reproduction. 4,099,862, Cl. 355-35.000.

Biesecker, James E.: *See—*
Gwozdz, Joseph W.; Biesecker, James E.; and Snyder, Charles R., 4,099,753, Cl. 292-177.000.

Biller, Horst, to Mannesmannrohren-Werke, A.G. Stretch reducing of hollow stock. 4,099,402, Cl. 72-234.000.

Billington, Evans R.; and Nicholas, William, to Golconda Corporation. Thermal-manual control valve. 4,099,551, Cl. 141-388.000.

Bilow, Norman; and Kimmel, Boyce G., to Hughes Aircraft Company. Ethnyl terminated polyimide composites. 4,100,138, Cl. 526-262.000.

Binder, Georg; Lindauer, Rolf; Sohnle, Rudiger; and Wahler, Harald, to Robert Bosch GmbH. Alternator-rectifier-regulator unit or mushroom shape for vehicular service. 4,100,440, Cl. 310-89.000.

Binkley, Carl R.; Keir, John B.; and Semchena, John H., to Sperry Rand Corporation. Power transmission. 4,099,541, Cl. 137-596.130.

Biosearch Medical Products, Inc.: *See—*
Micklus, Michael J.; and Ou-Yang, David T., 4,100,309, Cl. 427-2.000.

Birtley Engineering Limited: *See—*
Adams, Terence C., 4,100,248, Cl. 264-273.000.

Bissett, Robert Stuart: *See—*
Theimer, Ernst Theodore; and Bissett, Robert Stuart, 4,099,454, Cl. 99-358.000.

Bittner, John E.; and Dodsworth, Robert S., to Minnesota Mining and Manufacturing Company. Electrical connector system. 4,099,816, Cl. 339-17.0CF.

Bitzer, Donald L.; and Tucker, Paul T., to University of Illinois Foundation. Method and apparatus for addressing and sustaining gas discharge panels. 4,100,535, Cl. 340-166.00R.

Bjorkman, Rune Harald: *See—*
Andren, Lars-Goran Hjalmar; Bjorkman, Rune Harald; Easterday, Richard Lee; and Munktell, Hans Gosta, 4,099,882, Cl. 356-181.000.

Black Clawson Company, The: *See—*
Seifert, Peter, 4,099,458, Cl. 100-116.000.

Blackwell, Henry Wayne, to Dresser Industries, Inc. Oilwell swab cup. 4,099,451, Cl. 92-241.000.

Blahak, Johannes: *See—*
Mazanek, Jan; Blahak, Johannes; Wagner, Kuno; and Ziemann, Heinz, 4,100,116, Cl. 521-167.000.

Blaisdell, Ronald G.; and Hough, Harold L., to GTE Sylvania Incorporated. Modular photochemotherapy chamber. 4,100,415, Cl. 250-455.000.

Blann, Ellis L. Container support. 4,099,693, Cl. 248-210.000.

Blinow, Igor, to Polaroid Corporation. Combined view and rangefinder with specially configured moving/lens. 4,100,556, Cl. 354-166.000.

Block Engineering, Inc.: *See—*
Hirschfeld, Tomas R., 4,100,416, Cl. 250-461.00B.

Blodgett, Norman S.: *See—*
Haddad, Daniel G., 4,099,716, Cl. 273-73.00E.

Bloomer, Ivan; and Young, Ronald William, to Carrier Drysys Limited. Treating paint waste solids. 4,100,066, Cl. 210-44.000.

Blount, David H. Process for the production of amine silicate compounds and their resinous condensation products. 4,100,112, Cl. 260-185.000.

Blunt, Dan R. Burial crypt and method of installation. 4,099,353, Cl. 52-139.000.

Boehmke, Gunther: *See—*
Konig, Joachim; Suling, Carlhans; and Boehmke, Gunther, 4,100,339, Cl. 526-193.000.

Boehringer Ingelheim GmbH: *See—*
Merz, Herbert; Walther, Gerhard; Langbein, Adolf; Stockhaus, Klaus; and Wick, Helmut, 4,100,288, Cl. 424-260.000.
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,100,282, Cl. 424-246.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Hoefke, Wolfgang; and Kohn, Franz Josef, 4,100,292, Cl. 424-273.00R.

Boeing Company, The: *See—*
Swanson, Everts W.; and Wehrman, Marvin D., 4,099,691, Cl. 244-207.000.

Boer, Joachim; and Frankenhauser, Georg, to Kraftwerk Union Aktien-

gesellschaft. Apparatus for cooling the end zones of the lamination stacks of electric machines. 4,100,439, Cl. 310-57.000.

Bogan, Gary W.; and Hickner, Richard A., to Dow Chemical Company, The. Radiation curable epoxy coating composition of dimer acid modified vinyl ester resin. 4,100,045, Cl. 204-159.160.

Bogri, Tibor: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,100,343, Cl. 542-426.000.

Bohy, August G.: *See—*
Barch, Herbert W.; and Bohy, August G., 4,099,307, Cl. 28-252.000.

Bond, Herbert M.; and Rucinski, Michael E., to Buckbee-Mears Company. Cutting teeth for etched abrasives. 4,099,935, Cl. 51-309.00R.

Bond, Joseph N. Gas operated underwater lamp. 4,100,593, Cl. 362-267.000.

Booty, Donald J., to Booty, Donald J.; and Feig, Marvin. Track lighting. 4,099,817, Cl. 339-22.00B.

Borg-Warner Corporation: *See—*
Goldberg, Gerald; and Kaufman, Paul Richard, 4,100,126, Cl. 260-29.6AQ.
Jilani, Atiq A., 4,099,576, Cl. 172-555.000.
Wiese, Winfred John, 4,099,728, Cl. 277-96.000.

Born, Gunthard; Hermansdorfer, Hans; Sepp, Gunther; and Grosch, Gerhard, to Messerschmitt-Bolkow-Blohm GmbH. Method for exciting a gas dynamic CO_2 laser and apparatus for performing the method. 4,100,507, Cl. 331-94.50G.

Borst, Wolfgang: *See—*
Pagel, Ernst-Olav; and Borst, Wolfgang, 4,099,507, Cl. 123-148.00E.

Bortfeld, Manfred: *See—*
Elsholz, Joachim; Bortfeld, Manfred; Maertz, Josef; and Poser, Erhard, 4,099,770, Cl. 297-216.000.

Bosaeus, Jan Anders: *See—*
Margen, Peter Heinrich Erwin; Bosaeus, Jan Anders; and Skarud, Bengt Olof Roland, 4,099,555, Cl. 165-55.000.

Boszak, Ronald J.: *See—*
Schlesinger, Sheldon Irwin; and Boszak, Ronald J., 4,100,321, Cl. 428-207.000.

Bott, John A. Article carrier for automotive vehicles. 4,099,658, Cl. 224-42.10F.

Bottenbruch, Ludwig: *See—*
Hess, Bernhard; Raichle, Karl; Bottenbruch, Ludwig; Schulz-Walz, Hansjochen; and Alberts, Heinrich, 4,100,224, Cl. 260-862.000.

Boudewijns, Henricus P. J.; Riemens, Karel; and Eggermont, Ludwig D. J., to U.S. Philips Corporation. Dynamic control of code modulated pulse transmission. 4,100,494, Cl. 325-38.00B.

Boulenger, Paul; Angelier, Nicole; and Torres, Jean-Pierre, to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude. Method of treatment of an oxidizable material by a biochemical process. 4,100,062, Cl. 210-14.000.

Bousaid, Issam S., to Texaco Inc. Oil recovery process using a tapered surfactant concentration slug. 4,099,569, Cl. 166-273.000.

Bouvier, Alfred Joseph, to Bendix Corporation, The. Method of making electrical connector. 4,099,323, Cl. 29-629.000.

Bowerman, Leonard E. Vacuum cleaner having magnetic drive for agitator brush. 4,099,291, Cl. 15-390.000.

Bowley, Wallace W., to Hydra Corporation. Navigational buoy. 4,099,281, Cl. 9-8.00R.

Bowman, William G.; and Stadig, William P., to Petro-Tex Chemical Corporation. Dimerization of isobutene. 4,100,220, Cl. 260-683.15R.

Boxer, Leo M.; and Boxer, Robert W., to Lewis, Pauls & Associates, Ltd. Child resistant closure. 4,099,639, Cl. 215-209.000.

Boxer, Robert W.: *See—*
Boxer, Leo M.; and Boxer, Robert W., 4,099,639, Cl. 215-209.000.

Boyd, John H., Jr., to General Electric Company. Dynamoelectric machine winding arrangement. 4,100,444, Cl. 310-184.000.

Boyd, John Oliver, to Boyd, Joseph Lyndon. Feet, inches and sixteenths adder. 4,100,603, Cl. 364-771.000.

Boyd, Joseph Lyndon: *See—*
Boyd, John Oliver, 4,100,603, Cl. 364-771.000.

Boyer, Harold E.; and Trisler, Jerry V., to Graphics Equipment International Corporation. Radial roll folder. 4,099,710, Cl. 270-68.00A.

Bozzelli, John W.; Bremer, Donald N.; and Shier, George D., to Dow Chemical Company, The. Hydrolysis of carbon oxysulfide. 4,100,256, Cl. 423-220.000.

Brackman, Donald A.: *See—*
Hoover, Richard D.; Shaeffer, Raymond P.; and Brackman, Donald A., 4,100,612, Cl. 366-143.000.

Bradbury, Christopher G.; Buchan, Walter; Winiarski, Edward J.; and Kropa, Gomer E., to Leesona Corporation. Pellet cooling system. 4,099,900, Cl. 425-313.000.

Bradley, Curtis E. Fuel regenerated non-polluting internal combustion engine. 4,099,489, Cl. 123-3.000.

Bradley, Ronald W.: *See—*
Bialorucki, Edward J.; Bradley, Ronald W.; and Carl, David G., 4,099,486, Cl. 118-635.000.

Bradner, John H. Weight indicator. 4,099,586, Cl. 177-159.000.

Brady, Michael Barry Clive: *See—*
Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,100,458, Cl. 315-39.550.

Brakebill, Harold G., to Robertshaw Controls Company. Control system and control device therefor. 4,099,539, Cl. 137-84.000.

Brand, Derek A.: *See—*
Hicks, Alan A.; Brand, Derek A.; and Morrison, Howard J., 4,099,330, Cl. 33-18.00R.

Brandenstein, Manfred: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,099,605, Cl. 192-98.000.

Brannan, James R., to Diamond Shamrock Corporation. Coated cathode for electrolysis cells. 4,100,049, Cl. 204-242.000.

Brantingham, George Lawrence, to Texas Instruments Incorporated. Key debounce system for electronic calculator or microprocessor. 4,100,606, Cl. 364-900.000.

Brasey, Marcel; Schweizer, Alfred D.; and Shorrock, James C., to Gallaher Limited. Uronic oxidation of cellulose. 4,100,341, Cl. 536-56.000.

Brazendale, Peter Alan: *See—*
MacKellar, Jeremy Margreave; Dryden, Christopher Michael; and Brazendale, Peter Alan, 4,099,467, Cl. 102-217.000.

Bredeweg, Corwin J.; Dennis, Kent S.; and Lyons, Charles E., to Dow Chemical Company, The. Transparent impact-resistant polystyrene structure. 4,100,227, Cl. 260-880.00R.

Bredeweg, Corwin J.: *See—*
Dennis, Kent S.; Lyons, Charles E.; and Bredeweg, Corwin J., 4,100,228, Cl. 260-880.00R.

Breer, Karl, to Bayer Aktiengesellschaft. Apparatus for mixing fluid components which react quickly with one another to form a blowable, foam-forming mixture. 4,099,652, Cl. 222-135.000.

Bremer, Donald N.: *See—*
Bozzelli, John W.; Bremer, Donald N.; and Shier, George D., 4,100,256, Cl. 423-220.000.

Brennan, Leon E.; Lagermasini, Joseph P.; and Rarig, Larry L., to GTE Sylvania Incorporated. Aperture mask conveyor and inspection system. 4,099,607, Cl. 198-341.000.

Bretthauer, Harry, to Manning, James B., a part interest. Tool having removable cleaning element. 4,099,289, Cl. 15-244.00R.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Alkenyl and alkinylureido cephalosporins. 4,100,344, Cl. 544-21.000.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. 3-(Carbamoyl)pyridino derivatives of 7a-methoxy ureidocephalosporins. 4,100,345, Cl. 544-21.000.

Brewer, John C., to Garbalizer Machinery Corporation. Shredder structure and improvements therein. 4,099,678, Cl. 241-243.000.

Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, to Commissariat a l'Energie Atomique. Method of heat accumulation and a thermal accumulator for the application of said method. 4,099,557, Cl. 165-104.00S.

Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, to Commissariat a l'Energie Atomique. Method of heat accumulation and a thermal accumulator for the application of said method. 4,099,558, Cl. 165-104.00S.

Bridges, James R.: *See—*
Thompson, Larry W.; Bridges, James R.; and Fuchs, James A., 4,100,483, Cl. 324-6.000.

Briggs, Donald D.: *See—*
Haas, Ronald J.; and Briggs, Donald D., 4,100,333, Cl. 429-156.000.

Bright, Robert G., to Draftex Development AG. Channel-shaped guiding, sealing and finishing strips. 4,099,765, Cl. 296-93.000.

Brill, Klaus; and Schmid, Gunter, to Robert Bosch GmbH. Severing wire or ribbon material adjacent an attachment point, such as a solder, bond or weld connection, particularly in semiconductor and thin film structures. 4,099,663, Cl. 228-159.000.

Bristol-Myers Company: *See—*
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 4,100,346, Cl. 544-27.000.

Bristow, Stephen D.: *See—*
Dean, David W.; and Bristow, Stephen D., 4,099,719, Cl. 273-101.200.

British Petroleum Company Limited, The: *See—*
Brown, David Emmerson; Clark, John Trevor Kent; McCarroll, John James; and Sims, Malcolm Leslie, 4,099,990, Cl. 148-6.350.
Westermann, Peter Henry, 4,100,123, Cl. 260-28.50B.

Britschinn, Horst: *See—*
Neumann, Henning; Schalausky, Horst; and Britschinn, Horst, 4,099,656, Cl. 224-5.00W.

Britz, Hans Ernst. Optical antenna or lens. 4,099,879, Cl. 356-141.000.

Brogger, Ronald L.: *See—*
Christensen, Bryan L.; Sampson, William J.; Brogger, Ronald L.; and Lee, Jeffrey A., 4,099,285, Cl. 15-83.000.

Brois, Stanley J., to Exxon Research & Engineering Co. Olefin-thionophosphine sulfide reaction products, their derivatives and use thereof as oil and fuel additives. 4,100,187, Cl. 260-502.500.

Brongersma, Hidde Herman, to U.S. Phillips Corporation. Device for analyzing a surface layer by means of ion scattering. 4,100,409, Cl. 250-305.000.

Brooks, William T.; and Legrow, Gary E., to Dow Corning Corporation. Electrical devices containing silacyclopentene dielectric fluids. 4,100,090, Cl. 252-63.700.

Brouwer, Nicholaas L.: *See—*
Bennett, Robert F.; Brouwer, Nicholaas L.; and Stricker, David M., 4,099,418, Cl. 73-622.000.

Brouwer, Willem, to Coulter Information Systems, Inc. Lens testing method and apparatus. 4,099,877, Cl. 356-124.000.

Brown, David Emmerson; Clark, John Trevor Kent; McCarroll, John James; and Sims, Malcolm Leslie, to British Petroleum Company Limited, The. Method of applying a layer of silica on a substrate. 4,099,990, Cl. 148-6.350.

Brown, George Emmett, Jr., to Hoffman, Gene D. Method of and means for filtering the infrared rays from a source of UV radiation. 4,100,418, Cl. 250-510.000.

Brown, Robert W.: *See—*
Foris, Peter L.; Brown, Robert W.; and Phillips, Paul S., Jr., 4,100,103, Cl. 252-316.000.

Browski, Charles Robert: *See—*
Stiel, Donald Melvyn; Browski, Charles Robert; Neugroschel, Eric; and Williams, Joseph James, 4,100,598, Cl. 364-476.000.

Bruggert, Paul; and Schuller, Georges. Elastically resilient fastening clip. 4,099,299, Cl. 24-73.0PS.

Brumat, Giorgio: *See—*
Passalenti, Beppino; Brumat, Giorgio; and Vargiu, Silvio, 4,100,221, Cl. 260-835.000.

Brunswick Corporation: *See—*
Alexander, Charles F., Jr., 4,099,478, Cl. 115-18.00E.

Brutsch, Werner: *See—*
Behr, Michael Isaac; Gyi, KoKo; and Brutsch, Werner, 4,100,584, Cl. 360-125.000.

Bryant, George Macon: *See—*
Walter, Andrew Tainter; Bryant, George Macon; and Readshaw, Ronald Louis, 4,099,913, Cl. 8-173.000.

Bryant, James T.; and Burdette, George W., to United States of America, Navy. High density liquid ramjet fuel. 4,099,931, Cl. 44-80.000.

Brynjolfsson, Ari: *See—*
Laible, Roy C.; and Brynjolfsson, Ari, 4,099,726, Cl. 277-1.000.

Bubley, Henry J.; Oltra, Claude H.; and Krutsch, John R., to American Screen Printing. Turret indexing and registration means for multicolor printer. 4,099,460, Cl. 101-44.000.

Buchan, Walter: *See—*
Bradbury, Christopher G.; Buchan, Walter; Winiarski, Edward J.; and Kropa, Gomer E., 4,099,900, Cl. 425-313.000.

Buchheit, Robert F., to Xerox Corporation. D.C. Electrometer. 4,100,484, Cl. 324-32.000.

Buck, Robert. Electronic monitoring system with Zener diode to control capacitor charging current. 4,100,479, Cl. 323-19.000.

Buckbee-Mears Company: *See—*
Bond, Herbert M.; and Rucinski, Michael E., 4,099,935, Cl. 51-309.00R.

Buckler, Robert Thomas, to Miles Laboratories, Inc. Cyclohexanone 5,6-benzo analogues of prostaglandin E. 4,100,185, Cl. 260-465.00F.

Buckler, Robert Thomas, to Miles Laboratories, Inc. Cyclohexanone-5,6-benzo analogues of prostaglandin. 4,100,352, Cl. 560-53.000.

Buckler, Robert Thomas, to Miles Laboratories, Inc. 5,6-Benza analogues of prostaglandin F. 4,100,353, Cl. 560-55.000.

Buckley, John, to English Card Clothing Company Limited, The. Card-clothing. 4,100,006, Cl. 156-78.000.

Buckner, Walter E.: *See—*
Leonard, Thomas E.; and Buckner, Walter E., 4,099,635, Cl. 214-152.000.

Budzich, Tadeusz. Load responsive fluid control system. 4,099,379, Cl. 60-427.000.

Bull, Michael J.; and Searle, Robert J. G., to Shell Oil Company. 2-Substituted isovaleric acid ester pesticides. 4,100,363, Cl. 560-255.000.

Bunker Ramo Corporation: *See—*
Keglewitsch, Josef, 4,099,819, Cl. 339-75.00M.

Burdette, George W.: *See—*
Bryant, James T.; and Burdette, George W., 4,099,931, Cl. 44-80.000.

Burger, Edward D., to Atlantic Richfield Company. Inclined conveyor belt solids separation system. 4,099,622, Cl. 209-114.000.

Burkhardt, Siegfried: *See—*
Ehlers, Klaus-Peter; Lischka, Siegfried; and Burkhardt, Siegfried, 4,100,261, Cl. 423-309.000.

Burkl, Erich: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,099,605, Cl. 192-98.000.

Burness, Donald MacArthur: *See—*
Maggiulli, Cataldo Aldino; Burness, Donald MacArthur; and Perkins, William Clarence, 4,100,200, Cl. 260-609.00R.

Burnham, Robert D.; and Scifres, Donald R., to Xerox Corporation. Method of making etched-striped substrate planar laser. 4,099,999, Cl. 148-187.000.

Burnham, Roger R.; Chapin, Merlin K.; Cook, David A.; Gilles, Theodore C.; and Williams, Billy L., to Lennox Industries, Inc. Variable air volume system. 4,099,553, Cl. 165-22.000.

Burns, Carmen D.: *See—*
Schultz, James Edward; and Burns, Carmen D., 4,099,660, Cl. 228-13.000.

Burns, Michael E.; and Pracht, Hans J., to Procter & Gamble Company, The. Novel cellulose ethers and detergent compositions containing same. 4,100,094, Cl. 252-89.00R.

Burns, Michael Eugene: *See—*
Hutchins, James Peyton; Julian, Donald Victor; and Burns, Michael Eugene, 4,100,095, Cl. 252-99.000.

Burroughs Corporation: *See—*
Behr, Michael Isaac; Gyi, KoKo; and Brutsch, Werner, 4,100,584, Cl. 360-125.000.
Tam, Richard K., 4,100,477, Cl. 323-19.000.
Tam, Richard K., 4,100,478, Cl. 323-19.000.

Burski, Ronald C.: *See—*
Lytle, Dan R.; and Burski, Ronald C., 4,100,480, Cl. 323-51.000.

Burt, Gerald Dennis; and Mudrak, Anton, to Harshaw Chemical Company, The. Zirconate treated antimony compounds. 4,100,077, Cl. 252-8.100.

Burt, Gerald Dennis: *See—*
Ashman, John Slocum; Burt, Gerald Dennis; and Mudrak, Anton, 4,100,076, Cl. 252-8.100.

Bush Boake Allen Limited: *See—*
Ansari, Hifzur Rahman; Unwin, Neville; and Wagner, Horst Richard, 4,100,110, Cl. 252-522.000.

Bustos, Rafael T., to Leggett & Platt, Incorporated. Display rack. 4,099,625, Cl. 211-49.00R.

Butler Automatic, Inc.: *See—*
Meihofer, Edward F.; Corcoran, George F.; and Clifford, John W., 4,100,012, Cl. 156-351.000.

Butler, Crispin O. Chaotic motion generator. 4,099,340, Cl. 35-19.00R.

Butt, Sheldon H., to Olin Corporation. Solar absorber plate design. 4,099,559, Cl. 165-170.000.

Buttner-Schilde-Haas Aktiengesellschaft: *See—*
Beck, Arnold, 4,099,898, Cl. 425-192.00S.

Byron, Harlund L.: *See—*
Stahl, Oliver B.; and Byron, Harlund L., 4,100,539, Cl. 340-546.000.

C J Wennberg AB: *See—*
Berg, Stig Ove; and Persson, Rolf Tore, 4,099,632, Cl. 214-17.0DA.

C P Associates Limited: *See—*
Diebold, Vincent B.; Cowan, Wavell F.; and Walsh, John K., 4,100,016, Cl. 162-16.000.

C. van der Lely N.V.: *See—*
van der Lely, Ary, 4,099,575, Cl. 172-59.000.

Cadeddu, Leonardo, to Benditalia S.p.A. Master-cylinder for hydraulic booster. 4,099,380, Cl. 60-588.000.

Calcagno, Benedetto: *See—*
Di Fiore, Lucio; Calcagno, Benedetto; and Ghirga, Marcello, 4,100,212, Cl. 260-660.000.

Calderon, Albert. Method and apparatus for controlling emissions from oxygen steelmaking furnaces. 4,099,709, Cl. 266-44.000.

Caldwell, David W. Engine powered water craft. 4,099,477, Cl. 114-281.000.

Calgon Corporation: *See—*
Sinkovitz, Gloria DiMarco; and Sharpe, Andrew Jackson, Jr., 4,100,079, Cl. 252-8.55C.

Callahan, James J.: *See—*
Powell, John H.; and Callahan, James J., 4,099,597, Cl. 184-27.00B.

Callahan, John A.; and Ottenstein, Allan S., to RF Products Corp. Gasoline pump price encoder. 4,100,400, Cl. 235-92.0FL.

Calzificio Golden Lady S.a.s. di Grassi Nerino & C.: *See—*
Zaglio, Sergio, 4,099,789, Cl. 302-2.00R.

Cameron Iron Works, Inc.: *See—*
Allen, Herbert, 4,099,699, Cl. 251-1.00B.

Cammack, Travers Kregg, II; and Nyberg, David Dolph, to Raychem Corporation. High-voltage insulating material comprising anti-tracking and erosion inhibiting compounds with insulating polymers. 4,100,089, Cl. 252-63.000.

Campbell, Donn V.; and Paragi, Edward J., to United States of America, Army. Airborne antenna system employing the airframe as an antenna. 4,100,546, Cl. 343-708.000.

Campbell, Kenneth, to Campbell, Miriam N. Sawtoothed diffuser, vaned, for centrifugal compressors. 4,099,891, Cl. 415-207.000.

Campbell, Miriam N.: *See—*
Campbell, Kenneth, 4,099,891, Cl. 415-207.000.

Campbell, Ramsey G.: *See—*
Martines, Vincent C.; and Campbell, Ramsey G., 4,100,190, Cl. 260-543.00H.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Sterling, Thomas S.; Belanger, Jean-Yves; and Kalman, Kenneth S., 4,100,000, Cl. 149-4.000.

Canadian General Electric Co., Ltd.: *See—*
Hollitscher, Herbert, 4,100,382, Cl. 200-61.460.

Canevari, Roger: *See—*
Regnier, Gilbert; Canevari, Roger; Poignant, Jean-Claude; and Laubie, Michel, 4,100,286, Cl. 424-251.000.

Cannon, Thomas C., Jr. Card table attachment. 4,099,470, Cl. 108-26.000.

Canon Kabushiki Kaisha: *See—*
Kawamura, Naoto; Tajima, Akira; and Tanaka, Katumi, 4,099,846, Cl. 350-186.000.
Muto, Hakaru; Kurabayashi, Sadasuke; Takatori, Yasushi; Yamaguchi, Isao; and Watanabe, Asao, 4,100,552, Cl. 346-162.000.
Nakamura, Zenzo; Ohtaki, Syohei; Tsunekawa, Tokuichi; Ito, Tadashi; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,100,459, Cl. 315-136.000.
Takesi, Kunio; and Tanaka, Kazuo, 4,099,845, Cl. 350-184.000.

Cantenot, Paul. Device for evacuation of solid materials. 4,099,633, Cl. 214-17.0DA.

Caplan, David M., to AMF Incorporated. Bowling ball. 4,099,715, Cl. 273-63.00E.

Caricchio, Jerome Joseph, Jr.; and York, Edward Robert, to International Business Machines Corporation. Method for plating palladium-nickel alloy. 4,100,039, Cl. 204-43.00N.

Carl, David G.: *See—*
Bialorucki, Edward J.; Bradley, Ronald W.; and Carl, David G., 4,099,486, Cl. 118-635.000.

Carl Still Recklinghausen, Firma: *See—*
Tippmer, Kurt; Schmitt, Hubert; Vinke, Heinrich; and Abendroth, Georg, 4,099,929, Cl. 44-1.00F.

Carlberg, John R.: *See—*
Chou, Eddie C.; Queneau, Paul B.; Laferty, John M.; and Carlberg, John R., 4,100,043, Cl. 204-108.000.

Carlisle, Arthur Wallace; and Frey, Dean Rudisill, to Bell Telephone

Laboratories, Incorporated. Connector for making splicing, half-tap, bridging and terminating connections of multiple insulated conductors. 4,099,822, Cl. 339-98.000.
Carlson, David H. J.; and Deering, James R., to UOP Inc. Method of treating a sour petroleum distillate. 4,100,057, Cl. 208-206.000.
Carlson, Peter B., to Taylor Medical Oxygen Services, Inc. Monitor for gas piping system. 4,100,537, Cl. 340-626.000.
Carnewal, Jose A. C. L.; and Hommez, Etienne R. O. C., to Sperry Rand Corporation. Rotary air filter. 4,099,942, Cl. 55-396.000.
Carney, James A.: *See*—
Vanden Broek, Jan A.; and Carney, James A., 4,099,881, Cl. 356-171.000.
Carr, Frank J., to Westinghouse Electric Corp. Vehicle control scanning system. 4,099,591, Cl. 180-98.000.
Carr, Peter, to Energy Development Associates. Comb type bipolar electrode elements and battery stacks thereof. 4,100,332, Cl. 429-27.000.
Carrier Drysys Limited: *See*—
Bloomer, Ivan; and Young, Ronald William, 4,100,066, Cl. 210-44.000.
Carter, David; Withnall, Malcolm; Williams, Alan; Redshaw, Digby Ralph; and Stevens, Richard William, to Post Office, The. Communication units. 4,100,379, Cl. 179-147.00R.
Carter, Philip L.; Kim, Yung K.; and Riley, Michael O., to Dow Corning Corporation. Fluorocarbon siloxane compositions. 4,100,136, Cl. 528-11.000.
Cartwright, Terence, to G. D. Searle & Co. Stabilization of interferon against mechanical stress using thioctic acid. 4,100,150, Cl. 260-112.00R.
Casey, Edward H., to ACF Industries, Inc. Means for imparting supersonic flow characteristics in the intake manifold of an internal combustion engine. 4,099,503, Cl. 123-122.0AB.
Casowitz, Barry N.; Cowan, Michael D.; Humphreys, Charles B.; and Satya, Akella V. S., to International Business Machines Corporation. Monitor for semiconductor diffusion operations. 4,100,486, Cl. 324-62.000.
Caterpillar Mitsubishi Ltd.: *See*—
Lamprecht, Walther, 4,100,030, Cl. 195-103.50R.
Caterpillar Tractor Co.: *See*—
Beckham, Joel M.; Easterling, Gene B.; Ringel, Reginald K.; and Wolff, Egon E., 4,099,577, Cl. 172-781.000.
Dezelan, Joseph Edward, 4,099,588, Cl. 180-44.00F.
Goloff, Alexander; and Keske, Frank E., 4,099,494, Cl. 123-32.0JV.
Groff, Eugene R., 4,099,796, Cl. 305-46.000.
Maier, Roger F.; Milligan, Jimmy L.; Bahnfleth, William A.; and Taylor, James L., 4,099,763, Cl. 296-28.00C.
Roley, Robert D., 4,099,795, Cl. 305-18.000.
Shaffer, Walter M., 4,099,378, Cl. 60-413.000.
Caulier, Daniel Pierre. Solar energy pick-up. 4,099,516, Cl. 126-271.000.
Caullet, Pierre Leon Adolphe: *See*—
Manier, Francis Rene Daniel; and Caullet, Pierre Leon Adolphe, 4,100,131, Cl. 260-42.210.
Cavazza, Claudio, to Sigma-Tau. Amidic derivatives of nicotinic acid as therapeutics. 4,100,289, Cl. 424-266.000.
CCL Systems, Ltd.: *See*—
Outram, Christopher David, 4,099,360, Cl. 52-745.000.
Celanese Corporation: *See*—
Runyan, Gary L., 4,099,705, Cl. 251-171.000.
Wesley, John, 4,099,308, Cl. 28-273.000.
Centronics Data Computer Corp.: *See*—
Rodesch, Dale F.; and Johnson, George E., 4,099,722, Cl. 273-143.00R.
CGEE Alsthom S.A.: *See*—
Debaigt, Jean, 4,099,821, Cl. 339-91.00R.
Chafetz, Harry: *See*—
Larkin, John M.; and Chafetz, Harry, 4,100,086, Cl. 252-50.000.
Chambley, Phillip Wayne: *See*—
Norris, Alan Hedley; Cromer, Edwin Dwain; and Chambley, Phillip Wayne, 4,099,393, Cl. 68-22.00R.
Champeau, Marcel; and Pelletier, Andre, to Societa RAM0 S.A. Apparatus for controlling the position of a template for a copying machine. 4,099,432, Cl. 82-14.00A.
Champion International Corporation: *See*—
Hanson, Wallace E., 4,099,612, Cl. 206-45.190.
Norris, Alan Hedley; Cromer, Edwin Dwain; and Chambley, Phillip Wayne, 4,099,393, Cl. 68-22.00R.
Champion Products Inc.: *See*—
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,099,485, Cl. 118-301.000.
Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Claisen intermediates. 4,100,175, Cl. 260-345.500.
Chang, James F. Couples chair. 4,099,773, Cl. 297-270.000.
Chapin, Merlin K.: *See*—
Burnham, Roger R.; Chapin, Merlin K.; Cook, David A.; Gilles, Theodore C.; and Williams, Billy L., 4,099,553, Cl. 165-22.000.
Charlton, Willis Herbert. Type of single phase induction motor assembly. 4,100,467, Cl. 318-220.00R.
Chekirda, Russell F., to Lear Siegler, Inc. Telescopic seat positioning mechanism. 4,099,777, Cl. 297-375.000.
Chen, Chieh Y.; and Grace, Wesley R., to America Pacemaker Corporation. Cardiac pacer circuitry to facilitate testing of patient heart activity and pacer pulses. 4,099,530, Cl. 128-419.0PT.
Chen, Nai Y., to Mobil Oil Corporation. Selective production of paraxylene. 4,100,215, Cl. 260-671.00M.
Chen, Nai Yuen; and Haag, Werner O., to Mobil Oil Corporation. Ethane conversion process. 4,100,218, Cl. 260-673.000.
Chevron Research Company: *See*—
Adams, John Howard, 4,100,080, Cl. 252-18.000.
Bacskai, Robert, 4,100,146, Cl. 528-313.000.
Dreher, John L.; and Crocker, Richard E., 4,100,081, Cl. 252-25.000.
Fischer, William; and Rogge, Virgil D., 4,099,560, Cl. 166-0.500.
House, Ralph, 4,100,145, Cl. 528-312.000.
Hutchison, Stanley O.; and Anderson, Glenn W., 4,099,563, Cl. 166-191.000.
Hutchison, Stanley O., 4,099,564, Cl. 166-241.000.
Chicago Lock Co.: *See*—
Kerr, William J., 4,099,396, Cl. 70-363.000.
Child, Edward T., to Texaco Development Corporation. Conversion of solid fuels to fluid fuels. 4,099,932, Cl. 48-197.00R.
Chinoy, Elizabeth Kurz, executrix: *See*—
Ferro, Armand P.; and Kurz, Bruno F., deceased, 4,099,998, Cl. 148-187.000.
Chipner, Russell W.; and Graff, James C., to General Electric Company. Lamp and socket assembly. 4,100,448, Cl. 313-318.000.
Chisso Corportion: *See*—
Nakajima, Takayoshi; Sonoda, Hiroshi; Sasaki, Katsutoshi; and Hane, Teruaki, 4,100,009, Cl. 156-184.000.
Chisum, Gloria T., to United States of America, Navy. Custom fitted, light weight, air conditioned protective helmet. 4,100,320, Cl. 428-188.000.
Chivinsky, Joseph A.; and Deverell, Harry E., to Allegheny Ludlum Industries, Inc. Austenitic stainless steel. 4,099,966, Cl. 75-125.000.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Yanagioka, Hiroshi; Shimizu, Shinichi; and Tamura, Kouichi, 4,099,925, Cl. 23-285.000.
Cho, Alfred Yi; and Tsang, Won-Tien, to Bell Telephone Laboratories, Incorporated. Fabrication of mesa devices by MBE growth over channeled substrates. 4,099,305, Cl. 29-579.000.
Chou, Eddie C.; Queneau, Paul B.; Laferty, John M.; and Carlberg, John R., to Amax Inc. Atmospheric leach ion-exchange process for treating iron-containing nickel-copper matte. 4,100,043, Cl. 204-108.000.
Chow, Ralph Gee: *See*—
Wardwell, John Albert; Stewert, Ray Alan; and Chow, Ralph Gee, 4,099,643, Cl. 220-222.000.
Christensen, Bryan L.; Sampson, William J.; Brogger, Ronald L.; and Lee, Jeffrey A., to Tennant Company. High lift surface maintenance machine. 4,099,285, Cl. 15-83.000.
Christenson, Christopher P.; and McNamee, Gary M., to Dow Chemical Company, The. Process for cleaning fouled heat exchangers. 4,099,984, Cl. 134-2.000.
Christenson, Christopher P.; Faller, John W.; and McNamee, Gary M., to Dow Chemical Company, The. Process for preparing cuprous aluminum tetrahalide complexing agents. 4,100,183, Cl. 260-438.100.
Chu, Joseph Y.; and Schank, Richard L., to Xerox Corporation. Novel elastomers and improved waterless lithographic printing masters. 4,100,135, Cl. 528-11.000.
Chubb Fire Security Limited: *See*—
Cooper, Gerald Edward; and Stratton, Robert Eugene, 4,099,574, Cl. 169-47.000.
Chuvpilo, Albert Vladimirovich: *See*—
Belyshev, Leonid Lavrentievich; Gorokhov, Veniamin Ivanovich; and Chuvpilo, Albert Vladimirovich, 4,099,549, Cl. 141-32.000.
Ciba-Geigy AG: *See*—
Koller, Stefan; Reinker, Dieter; and Schwander, Hans Rudolf, 4,099,909, Cl. 8-41.00C.
Ciba-Geigy Corporation: *See*—
Farooq, Saleem; and Karrer, Friedrich, 4,100,296, Cl. 424-278.000.
Gatzi, Karl, 4,100,290, Cl. 424-266.000.
Habermeier, Jurgen, 4,100,348, Cl. 548-310.000.
Kuhne, Manfred; Kocher, Clemens; and Gallay, Jean Jacques, 4,100,283, Cl. 424-248.500.
Lauterbach, Horst, 4,100,315, Cl. 427-379.000.
Miller, Ralph, 4,100,263, Cl. 423-383.000.
Mueller, Karl, 4,100,225, Cl. 260-878.00R.
Muller, Paul, 4,100,156, Cl. 260-174.000.
Muller, Paul; and Muller, Willy, 4,100,157, Cl. 260-174.000.
Peter, Heinz; Reinehr, Dieter; and Troxler, Eduard, 4,100,111, Cl. 528-116.000.
Petitpierre, Jean Claude, 4,100,169, Cl. 260-306.80R.
Zahir, Abdul-Cader; and Renner, Alfred, 4,100,140, Cl. 526-90.000.
Cicognani, Mario; and Mirabelli, Bruno, to Industrie Pirelli S.p.A. Oil resistant toothed belt. 4,099,422, Cl. 74-231.00C.
Cincinnati Milacron Inc.: *See*—
Dawson, James Earl, 4,099,904, Cl. 425-563.000.
Nash, Myrwin William; Barry, John Kenneth; and Wiatt, James Gordon, 4,099,905, Cl. 425-589.000.
Citizen Watch Co., Ltd.: *See*—
Fujita, Hiroo; Tsuzuki, Akira; and Morokawa, Shigeru, 4,100,540, Cl. 340-324.00M.
Mochizuki, Yoshifumi; and Morokawa, Shigeru, 4,099,371, Cl. 58-22.700.
Claasen, Theodoor Antonius Carel Maria; and Peek, Johannes Bernhard Heinrich, to U.S. Philips Corporation. Cross-correlation arrangement. 4,100,378, Cl. 179-84.0VF.
Clapot, Claude; Vial, Jean; and Dumont, Louis, to Philagro. Plant regulating compounds. 4,099,955, Cl. 71-98.000.
Clark Equipment Company: *See*—
Peppel, Jon H., 4,099,603, Cl. 192-3.310.

Clark, John Trevor Kent: *See—*
Brown, David Emmerson; Clark, John Trevor Kent; McCarroll, John James; and Sims, Malcolm Leslie, 4,099,990, Cl. 148-6.350.

Clark, Lowell E., to Motorola, Inc. Semiconductor magnetic transducers. 4,100,563, Cl. 357-27.000.

Clark, William T. Vaulted structure. 4,099,352, Cl. 52-80.000.

Clason, Donald Lynn; Pindar, John Francis; and Cohen, Jerome Martin, to Lubrizol Corporation, The. Lubricants containing amino phenol-detergent/dispersant combinations. 4,100,082, Cl. 252-33.400.

Claypoole, Stewart A., to Corning Glass Works. Method of forming an optical waveguide cable. 4,100,008, Cl. 156-180.000.

Cleare, Michael James: *See—*
Hydes, Paul Cedric; and Cleare, Michael James, 4,100,158, Cl. 544-225.000.

Clemence, Francois; and Humbert, Daniel, to Roussel Uclaf. Novel 1,4-benzodioxanes. 4,100,291, Cl. 424-267.000.

Clifford, John W.: *See—*
Meihofer, Edward F.; Corcoran, George F.; and Clifford, John W., 4,100,012, Cl. 156-351.000.

Clinard, Ralph. Drain system. 4,099,598, Cl. 184-106.000.

Clinch, Colin W.F.: *See—*
Palmer, John P.; Clinch, Colin W.F.; and Harley, David N., 4,099,757, Cl. 292-336.300.

Clive-Smith, Martin: *See—*
Nessfield, Stanley; Foster, John Elliott; and Clive-Smith, Martin, 4,099,640, Cl. 220-6.000.

Clouse, Robert C.; and Asperger, Robert G., to Dow Chemical Company, The. Cobalt-containing inhibitor for sour gas conditioning solutions. 4,100,100, Cl. 252-189.000.

Clouse, Robert C.: *See—*
Asperger, Robert G.; and Clouse, Robert C., 4,100,099, Cl. 252-189.000.

Cluett, Peabody & Co., Inc.: *See—*
Lawrence, Jackson, 4,099,911, Cl. 8-125.000.

Cobbs, James H. Drill pipe joint. 4,099,745, Cl. 285-24.000.

Coberley, Daniel A.; and Hutchison, Joel F., to Hurletron Altair, Inc. Alternating current energized printing system utilizing a dielectric covered resilient impression roller. 4,099,462, Cl. 101-153.000.

Cofer, Daniel B.: *See—*
Berry, Milton E.; and Cofer, Daniel B., 4,099,399, Cl. 72-38.000.

Coffman, Jerry L., to TRW Inc. Pump with electrically actuated flow control. 4,099,893, Cl. 417-300.000.

Cohen, Jerome Martin: *See—*
Clason, Donald Lynn; Pindar, John Francis; and Cohen, Jerome Martin, 4,100,082, Cl. 252-33.400.

Colby, Wenham J. Bathtub. 4,099,273, Cl. 4-173.00R.

Cole, Judson C.; and Morain, Eldon W. Adjustable height sprinkler. 4,099,670, Cl. 239-205.000.

Coleman Company, Inc., The: *See—*
Curtis, Richard Douglas, 4,099,538, Cl. 137-73.000.

Colgate-Palmolive Company: *See—*
Ehrlich, Robert L., 4,099,912, Cl. 8-137.000.
Fischer, Charles F., 4,100,618, Cl. 366-297.000.
Gaffar, Abdul, 4,100,270, Cl. 424-54.000.

Columbia Chemical Corporation: *See—*
Rosenberg, William E., 4,100,040, Cl. 204-55.00R.

Combustion Engineering, Inc.: *See—*
Andrews, Mena G., 4,100,020, Cl. 176-68.000.
Sander, Georg; Jacobson, Sven Eric; and Ericson, Ake Magnus Ivar, 4,099,471, Cl. 110-182.500.

Cominco Ltd.: *See—*
Swinkels, Godefridus M., 4,100,250, Cl. 423-34.000.

Commercial Electronics, Inc.: *See—*
Kline, Donald D., 4,100,568, Cl. 358-21.000.

Commissariat a l'Energie Atomique: *See—*
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,557, Cl. 165-104.00S.
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,558, Cl. 165-104.00S.
Loty, Charles, 4,100,406, Cl. 250-213.0VT.

Compaan, Pieter, to Intercontinental Truck Body - Montana, Inc. Interlocking panel sections. 4,099,358, Cl. 52-588.000.

Compagnie Francaise de Raffinage: *See—*
Muller, Alain, 4,100,109, Cl. 252-465.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Salaun, Andre; and Trempu, Rene, 4,100,259, Cl. 423-242.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel S.A.: *See—*
Louit, Henri, 4,099,407, Cl. 73-88.50R.
Stenstrom, Claude; and Saint-Supery, Christian, 4,100,369, Cl. 178-67.000.

Computer Automation, Inc.: *See—*
Kaufman, Phillip A.; and Washburn, Jerry R., 4,100,601, Cl. 364-200.000.

Connelly, Arthur J.: *See—*
Martin, T. Edward, 4,099,410, Cl. 73-151.500.

Connin, John L., to Eastman Kodak Company. Copier/duplicator priority interrupt apparatus. 4,099,860, Cl. 355-14.000.

Continental Group, Inc., The: *See—*
Gordon, Gerald A.; and Josephy, Karl, 4,100,236, Cl. 264-8.000.

Continental Oil Company: *See—*
Goodwin, Thomas E.; and Starks, Charles M., 4,100,207, Cl. 568-804.000.
Libbey, William J., 4,100,209, Cl. 568-918.00D.
Sheely, Clyde Q., Jr.; and Baldwin, David E., Jr., 4,099,565, Cl. 166-252.000.
Smith, George E., 4,100,035, Cl. 202-227.000.

Convergence Corporation: *See—*
Skinner, William D., 4,100,607, Cl. 364-900.000.

Conwed Corporation: *See—*
Hudler, Charles William; Swanson, Clare Eugene; Sundin, George Holger; and Niemi, Ilmer Issac, 4,099,619, Cl. 206-524.100.

Cook, David A.: *See—*
Burnham, Roger R.; Chapin, Merlin K.; Cook, David A.; Gilles, Theodore C.; and Williams, Billy L., 4,099,553, Cl. 165-22.000.

Cook, Edward H., Jr.; and Marks, Gerald R., to Hooker Chemicals & Plastics Corp. Coating metal anodes to decrease consumption rates. 4,100,050, Cl. 204-252.000.

Cook, Jack E.; and Bailey, Terry R., to Minnesota Mining and Manufacturing Company. Reflective sheet material. 4,099,838, Cl. 350-105.000.

Cooke, P. Richard, to Midnight Ears, Inc. Fluorescent tube indicator mounted on antenna. 4,100,547, Cl. 343-721.000.

Cooper, George A., to Institut Cerac SA. Method and apparatus for breaking hard compact material such as rock. 4,099,784, Cl. 299-10.000.

Cooper, Gerald D.: *See—*
Wojcik, Bruce C.; Herrett, Wilfred H.; Cooper, Gerald D.; Goold, Reed; and Wojcik, Charles W., 4,100,042, Cl. 204-105.00R.

Cooper, Gerald Edward; and Stratton, Robert Eugene, to Chubb Fire Security Limited. Fire-fighting compositions. 4,099,574, Cl. 169-47.000.

Cooper, John T.: *See—*
Hollenbeck, Alfred L.; De Tuerk, Alison V.; and Cooper, John T., 4,099,571, Cl. 166-315.000.

Cooper, Kenneth; Groves, Ian Stanley; Leigh, Peter Alexander; McIntyre, Neil; O'Hara, Sydney; and Speight, John Donald, to Post Office, The. Semiconductor devices. 4,099,318, Cl. 29-578.000.

Cooper Laboratories, Inc.: *See—*
Krezanoski, Joseph Z., 4,100,271, Cl. 424-78.000.

Corbin, John R. Van top tent. 4,099,534, Cl. 135-4.00A.

Corcoran, George F.: *See—*
Meihofer, Edward F.; Corcoran, George F.; and Clifford, John W., 4,100,012, Cl. 156-351.000.

Cornell Research Foundation, Inc.: *See—*
Stouffer, James R.; and Westervelt, Rudy G., 4,099,420, Cl. 73-629.000.

Corning Glass Works: *See—*
Bartholomew, Roger F.; and Wu, Che-Kuang, 4,099,978, Cl. 106-53.000.
Claypoole, Stewart A., 4,100,008, Cl. 156-180.000.

Cornish, David John, to Dreibholz & Floering Limited. Treatment of vegetables. 4,099,456, Cl. 99-638.000.

Coronelli, Carolina: *See—*
Pagani, Hermes; Parenti, Francesco; Coronelli, Carolina; and Tamoni, Giorgio, 4,100,273, Cl. 424-117.000.

Cortopassi, Dean A. Guidance control system for self-propelled mobile sprinkler irrigation systems. 4,099,669, Cl. 239-11.000.

Cosden Technology, Inc.: *See—*
Wiley, Donald F., 4,100,237, Cl. 264-40.600.

Costen, Robert C. Smokestack-mounted airfoil. 4,099,452, Cl. 98-58.000.

Coulter Electronics, Inc.: *See—*
Pedroso, Raul, 4,100,419, Cl. 250-514.000.

Coulter Information Systems, Inc.: *See—*
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Cowan, Michael D.: *See—*
Casowitz, Barry N.; Cowan, Michael D.; Humphreys, Charles B.; and Satya, Akella V. S., 4,100,486, Cl. 324-62.000.

Cowan, Wavell F.: *See—*
Diebold, Vincent B.; Cowan, Wavell F.; and Walsh, John K., 4,100,016, Cl. 162-16.000.

Cox, Randal A. Hay bale handling machine. 4,099,629, Cl. 214-1.0HH.

Cox, Terence Allan; and Lewis, David Roger, to Swish Products Limited. Structural elements. 4,099,815, Cl. 312-330.00R.

CPC International Inc.: *See—*
Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sakado, 4,100,025, Cl. 195-31.00F.

Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Hoffman, William, to Merck & Co., Inc. 5-(Hydroxy (substituted) methyl)-2,3-dihydrobenzo furan-2-carboxylic acid and its derivatives. 4,100,294, Cl. 424-275.000.

Creed, Sherman H., to FMC Corporation. Container filling employing anti-vacuum foot valve. 4,099,547, Cl. 141-5.000.

Crocker, Richard E.: *See—*
Dreher, John L.; and Crocker, Richard E., 4,100,081, Cl. 252-25.000.

Cromer, Edwin Dwain: *See—*
Norris, Alan Hedley; Cromer, Edwin Dwain; and Chambley, Phillip Wayne, 4,099,393, Cl. 68-22.00R.

Cronin, Michael Joseph, to Lockheed Aircraft Corporation. Tungsten lamp circuit for current limiting and fault indication. 4,100,586, Cl. 361-58.000.

Crosrol Limited: *See—*
Pickles, John, 4,099,295, Cl. 19-106.00R.

Cross, Graham Westwood; and Reid, Thomas James, to Imperial Chemical Industries Limited. Shaped explosive charge casing. 4,099,464, Cl. 102-24.0HC.

Crown Cork & Seal Company, Inc.: *See—*
Dix, Joseph F.; and Sampson, Joseph, 4,099,361, Cl. 53-42.000.

Crum, Donald; Goff, McKinley; and Hampton, Edward L., to Leggett

& Platt, Incorporated. Control assembly for a reclining chair. 4,099,776, Cl. 297-329.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni: *See*—
Luvison, Angelo; and Pirani, Giancarlo, 4,100,495, Cl. 325-323.000.

Cue, Berkeley W., to Pfizer Inc. 1,4-Dioxo- and 4-oxoquinoxaline-2-carboxaldehyde sulfonylhydrazones and certain derivatives thereof. 4,100,284, Cl. 424-250.000.

Cueman, Glenn F.; and Becker, Robert J., to Zimmer, U.S.A. Inc. Sacro-lumbar support belt. 4,099,524, Cl. 128-78.000.

Cullen, Glenn Wherry: *See*—
Berkman, Samuel; Duffy, Michel Thomas; Kim, Kyong-Min; and Cullen, Glenn Wherry, 4,099,924, Cl. 23-273.0SP.

Cullings, Harold L. Suspended material handling unit. 4,099,761, Cl. 294-86.00R.

Curtis, Richard Douglas, to Coleman Company, Inc., The. Temperature-responsive shut-off for gas fuel regulator valve. 4,099,538, Cl. 137-73.000.

Cutler-Hammer, Inc.: *See*—
Piber, Earl T., 4,100,383, Cl. 200-157.000.

D. L. Auld Company, The: *See*—
Waugh, Robert E., 4,100,010, Cl. 156-242.000.

Dadekian, Zaven Armen: *See*—
Eriksson, Jan Bertil; and Dadekian, Zaven Armen, 4,100,210, Cl. 260-652.00R.

Daggett, Kenneth E.: *See*—
Feilchenfeld, Michal M.; Daggett, Kenneth E.; and Lloyd, Raymond A., 4,099,668, Cl. 235-304.000.

Dai Nippon Toryo Co., Ltd.: *See*—
Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,100,454, Cl. 313-495.000.

Daimler-Benz Aktiengesellschaft: *See*—
Dobler, Helmut, 4,099,490, Cl. 123-210.000.
Kania, Siegmund; Zweigart, Gerhard; Luz, Karl; and Lutz, Edgar, 4,099,767, Cl. 296-137.00A.
Kolb, Ulrich, 4,099,506, Cl. 123-140.00J.
Schmid, Walter; Jambor, Arno; Wilfert, Karl, deceased; and Wilfert, Thomas, heir, 4,099,792, Cl. 303-113.000.
Wolters, Gerhard, 4,099,725, Cl. 277-1.000.

Dale Electronics, Inc.: *See*—
Kneifel, Jerome J.; and Veburg, John C., 4,100,489, Cl. 324-158.00F.

D'Alessio, Alfonso Joseph, to Bell Telephone Laboratories, Incorporated. High density multipair cable connecting block. 4,099,823, Cl. 339-113.00B.

Dalo, Jean: *See*—
Dalo, Pierre; and Dalo, Jean, 4,099,351, Cl. 52-2.000.

Dalo, Pierre; and Dalo, Jean. Inflatable structures. 4,099,351, Cl. 52-2.000.

Damon, Ralph S., to Hunter Investment Company. Diesel fueled engine coolant heater. 4,099,488, Cl. 122-156.000.

Danel, Francois Henri Paul, to Formaplex S.A. Under-water photographic apparatus. 4,100,553, Cl. 354-64.000.

Danfoss A/S: *See*—
Nylykke, Hans Peter Glud, 4,099,729, Cl. 277-96.100.

Daniels, Lonnie E., Jr. Method for making hollow panels. 4,100,239, Cl. 264-102.000.

Danneberg, Peter: *See*—
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,100,282, Cl. 424-246.000.

Dart Industries, Inc.: *See*—
Nergard, Orv, 4,099,642, Cl. 220-90.400.

Dataproducts Corporation: *See*—
Lytle, Dan R.; and Burski, Ronald C., 4,100,480, Cl. 323-51.000.

Dauenbaugh, Robert L., to Keystone Consolidated Industries, Inc. Snap-in cylinder for disc and pin tumbler cam locks. 4,099,397, Cl. 70-371.000.

Davidson, Bruce Lloyd: *See*—
Peake, Clinton Joseph; Harnish, Wayne Nelson; and Davidson, Bruce Lloyd, 4,100,281, Cl. 424-246.000.

Davies, Glyndwr John: *See*—
Baker, Dennis Stanley; and Davies, Glyndwr John, 4,099,804, Cl. 308-237.00R.

Davis Industrial (Equipment) Limited: *See*—
Davis, Maurice, 4,099,944, Cl. 55-501.000.

Davis, Maurice, to Davis Industrial (Equipment) Limited. Filters. 4,099,944, Cl. 55-501.000.

Davis, Royston H.; and Searle, Robert J. G., to Shell Oil Company. Dispirocyclopropane carboxylate pesticides. 4,100,298, Cl. 424-304.000.

Davis, Thomas G., to Xerox Corporation. Biasing arrangement for a corona discharge device. 4,100,411, Cl. 250-324.000.

Davis, William R.: *See*—
Decker, Donald H.; Davis, William R.; and Falleti, Duane W., 4,099,520, Cl. 128-2.00F.

Dawson, James Earl, to Cincinnati Milacron Inc. Nozzle shut-off valve for injection molding machine. 4,099,904, Cl. 425-563.000.

Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, to Lilly Industries Ltd. 3-Substituted propanoic acid derivatives. 4,100,350, Cl. 560-20.000.

Dayco Corporation: *See*—
Waugh, Dale L., 4,099,737, Cl. 280-261.000.

de la Pena, Ramon: *See*—
MacKay, Patrick W.; Vera, Enrique Martinez; and de la Pena, Ramon, 4,099,962, Cl. 75-26.000.

Dean, David W.; and Bristow, Stephen D., to Atari Inc. System and method for automatic alignment of gun with video display. 4,099,719, Cl. 273-101.200.

Debaigt, Jean, to CGEE Alsthom S.A. Electric connection block with multiple circuits. 4,099,821, Cl. 339-91.00R.

De Baker, Joseph R.; and Spaller, Albert E., Jr., to Eastman Kodak Company. Dual yarn tie-up and transfer tail apparatus. 4,099,679, Cl. 242-18.0PW.

DeBaryshe, Paul G.: *See*—
Glickler, Sheldon L.; and DeBaryshe, Paul G., 4,099,853, Cl. 350-310.000.

de Cachard, Maurice: *See*—
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,557, Cl. 165-104.00S.
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,558, Cl. 165-104.00S.

Decca Limited: *See*—
Bayliff, Raymond William, 4,100,371, Cl. 179-1.00E.

Decker, Donald H.; Davis, William R.; and Falleti, Duane W. Blood sampling apparatus. 4,099,520, Cl. 128-2.00F.

Decker, Donald L.; and Tolles, William M., to United States of America, Navy. Optical notch filter utilizing electric dipole resonance absorption. 4,099,854, Cl. 350-312.000.

Decor, Jean-Pierre, to Rhone-Poulenc Industries. Process for the preparation of halogenoacetals from esters. 4,100,201, Cl. 260-615.00A.

Deering, James R.: *See*—
Carlson, David H. J.; and Deering, James R., 4,100,057, Cl. 208-206.000.

Deggendorfer Werft und Eisenbau G.m.b.H.: *See*—
Gutlhuber, Friedrich; Jager, Adolf; and Ufholz, Heinrich, 4,099,926, Cl. 23-286.000.

DeLano, Don L., to Microdot Inc. Lamp socket. 4,099,820, Cl. 339-88.00R.

Delisle, Jules; Leroux, Adrien; and Mathieu, Serge, to H.O.P. Consulab Inc. Control system for limiting the electrical consumption of a distribution network. 4,100,428, Cl. 307-97.000.

Demag A.G.: *See*—
Olschewski, Bernd; and Wenzel, Werner, 4,099,960, Cl. 75-11.000.

Demerson, Christopher A.; and Humber, Leslie G., to American Home Products Corporation. 4,1-Benzoxazonine derivatives and process therefor. 4,100,277, Cl. 424-244.000.

Demole, Edouard P.; and Enggist, Paul F., to Firmenich SA. Flavoring ingredient. 4,099,531, Cl. 131-17.00R.

Demus, Dietrich: *See*—
Weissflog, Wolfgang; Schubert, Hermann; Kresse, Horst; Wiegeleben, Adalbert; and Demus, Dietrich, 4,099,856, Cl. 350-350.000.

den Brinker, Carl S.; and Nicholls, Keith David, to Texas Instruments Incorporated. Controlled mechanical system. 4,100,530, Cl. 340-53.000.

Denes, Oscar L., to Allen-Bradley Company. Single setting variable resistor. 4,100,525, Cl. 338-195.000.

Dennis, Kent S.; Lyons, Charles E.; and Bredeweg, Corwin J., to Dow Chemical Company, The. Transparent impact styrene polymer structure. 4,100,228, Cl. 260-880.00R.

Dennis, Kent S.: *See*—
Bredeweg, Corwin J.; Dennis, Kent S.; and Lyons, Charles E., 4,100,227, Cl. 260-880.00R.

DeNoyer, Donald B., to Sterling, Inc. Auger feed granulator. 4,099,677, Cl. 241-186.00A.

DePirro, Mario Louis. Post footing form holder and stabilizer system. 4,099,354, Cl. 52-146.000.

Derfler, William Duane: *See*—
Allen, Terry Mark; and Derfler, William Duane, 4,099,271, Cl. 2-192.000.

Desmarquest Et C.E.C.: *See*—
Bardet, Gerard, 4,100,386, Cl. 219-10.55M.

De Tuerk, Alison V.: *See*—
Hollenbeck, Alfred L.; De Tuerk, Alison V.; and Cooper, John T., 4,099,571, Cl. 166-315.000.

Devendorf, Alan E., to Magnavox Company, The. Housing and cover retaining means. 4,099,646, Cl. 220-324.000.

Deverell, Harry E.: *See*—
Chivinsky, Joseph A.; and Deverell, Harry E., 4,099,966, Cl. 75-125.000.

Dewing, Ernest William; Huni, Jean-Paul Robert; Sood, Raman Radha; and Southam, Frederick William, to Alcan Research and Development Limited. Process for the production of aluminium. 4,099,959, Cl. 75-10.00R.

Dezelan, Joseph Edward, to Caterpillar Tractor Co. Responsive pilot-operated control valve for front wheel drive. 4,099,588, Cl. 180-44.00F.

Dhein, Rolf: *See*—
Meyer, Rolf-Volker; and Dhein, Rolf, 4,100,223, Cl. 260-857.00L.

Diametrics, Inc.: *See*—
Peck, David B.; Guntlow, Vincent T.; and Netherwood, Paul H., 4,100,490, Cl. 324-182.000.

Diamond Shamrock Corporation: *See*—
Brannan, James R., 4,100,049, Cl. 204-242.000.
McCain, G. Howard, 4,100,113, Cl. 521-38.000.
Stillman, Neil W., 4,100,052, Cl. 204-268.000.

Dick, Charles B.; Knutson, Curtis L.; Jones, Frederick W.; and Ireland, Richard D., to United States of America, Navy. Method for connecting bimetallic members by explosive bonding. 4,099,661, Cl. 228-107.000.

Dickey-john Corporation: *See*—
Knepler, John T., 4,100,538, Cl. 340-617.000.

Diebold, Vincent B.; Cowan, Wavell F.; and Walsh, John K., to C P

Associates Limited. Solvent pulping process. 4,100,016, Cl. 162-16.000.

Diepers, Heinrich, to Siemens Aktiengesellschaft. Solar cell comprising semiconductive whiskers. 4,099,986, Cl. 136-89.0TF.

Di Fiore, Lucio; Calcagno, Benedetto; and Ghirga, Marcello, to Societa'Italiana Resine S.p.A. Process for chlorinating linear paraffins. 4,100,212, Cl. 260-660.000.

Dijkmans, Eise Carel; and Kuijk, Karel Elbert, to U.S. Philips Corporation. Transmission system for signal transmission by means of compressed delta modulation. 4,100,493, Cl. 325-38.00B.

Dillard, Robert D.; and Pavey, Donald E., to Eli Lilly and Company. 1,3-Dialkyl-6,7-methoxy-1H-1,2,4-benzothiadiazine-1-oxides. 4,100,280, Cl. 424-246.000.

Dir, Gary A.: *See—*
Haas, Werner E. L.; and Dir, Gary A., 4,100,088, Cl. 252-62.520.

Display Originals, Inc.: *See—*
Immordino, Vincent J., 4,099,650, Cl. 221-266.000.

Distenfeld, Carl H., to United States of America, Energy. Method for measuring dose-equivalent in a neutron flux with an unknown energy spectra and means for carrying out that method. 4,100,414, Cl. 250-391.000.

Ditthardt, Alfred R., to Zenith Radio Corporation. Electromagnetic optical beam controller having an eddy current damper for arresting mechanical resonance. 4,100,576, Cl. 358-128.000.

DiTullio, Joseph G.; and Parad, Leonard I., to GTE Sylvania Incorporated. Broadband microwave polarizer device. 4,100,514, Cl. 333-31.00A.

Dix, Joseph F.; and Sampson, Joseph, to Crown Cork & Seal Company, Inc. Apparatus for and method of closing containers. 4,099,361, Cl. 53-42.000.

Dmitrievsky, Nikolai Vasilievich: *See—*
Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Schedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich, 4,099,334, Cl. 33-346.000.

Doan, Duc. Visor optical camera system. 4,100,557, Cl. 354-225.000.

Dobler, Helmut, to Daimler-Benz Aktiengesellschaft. Method for producing a housing casing for a rotary piston internal combustion engine. 4,099,490, Cl. 123-210.000.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Haese, Egon, 4,099,554, Cl. 165-32.000.

Dodsworth, Robert S.: *See—*
Bittner, John E.; and Dodsworth, Robert S., 4,099,816, Cl. 339-17.0CF.

Dolinsek, Hans: *See—*
Thierer, Georg; and Dolinsek, Hans, 4,099,631, Cl. 214-10.000.

Donaldson Company, Inc.: *See—*
Ufken, Gregory Allen; and Ruopsa, Jon Arthur, 4,099,937, Cl. 55-212.000.

Donley, Harold E., to PPG Industries, Inc. Method for coating glass with silicon and a metal oxide and resulting product. 4,100,330, Cl. 428-429.000.

Dorman, Isidore, to NB Jackets Company. Structuring mechanism in reader-filler machine for microfiche jackets. 4,099,362, Cl. 53-123.000.

Dorsey, Geoffrey A., Jr., to Kaiser Aluminum & Chemical Corporation. Protective coating for aluminum products. 4,099,989, Cl. 148-6.270.

Dorsman, Adrian K., to Rockwell International Corporation. Phase-coded control for ring laser gyro. 4,099,876, Cl. 356-106.0LR.

D'Ottavio, Eugene D.: *See—*
Lombardo, Michael S.; Jacovich, Elaine F.; D'Ottavio, Eugene D.; and Grunwald, John J., 4,100,312, Cl. 427-96.000.

Dougherty, Steve John; and Garska, Kenneth Joseph, to Union Carbide Corporation. Recovery of sodium and antimony values from spent ethylene glycol residues. 4,100,253, Cl. 423-87.000.

Dover, Richard Thomas: *See—*
Hemmi, Christian Otto; Kesler, Oren Byrl; and Dover, Richard Thomas, 4,100,548, Cl. 343-837.000.

Dow Chemical Company, The: *See—*
Asperger, Robert G.; and Clouse, Robert C., 4,100,099, Cl. 252-189.000.
Baggett, Joseph McClendon; and Krause, Ruben Louis, 4,100,139, Cl. 528-196.000.
Bogan, Gary W.; and Hickner, Richard A., 4,100,045, Cl. 204-159.160.
Bozzelli, John W.; Bremer, Donald N.; and Shier, George D., 4,100,256, Cl. 423-220.000.
Bredeweg, Corwin J.; Dennis, Kent S.; and Lyons, Charles E., 4,100,227, Cl. 260-880.00R.
Christenson, Christopher P.; and McNamee, Gary M., 4,099,984, Cl. 134-2.000.
Christenson, Christopher P.; Faller, John W.; and McNamee, Gary M., 4,100,183, Cl. 260-438.100.
Clouse, Robert C.; and Asperger, Robert G., 4,100,100, Cl. 252-189.000.
Dennis, Kent S.; Lyons, Charles E.; and Bredeweg, Corwin J., 4,100,228, Cl. 260-880.00R.
Pagani, Hermes; Parenti, Francesco; Coronelli, Carolina; and Tamoni, Giorgio, 4,100,273, Cl. 424-117.000.

Dow Corning Corporation: *See—*
Bassani, Giovanni, 4,100,240, Cl. 264-108.000.
Brooks, William T.; and Legrow, Gary E., 4,100,090, Cl. 252-63.700.
Carter, Philip L.; Kim, Yung K.; and Riley, Michael O., 4,100,136, Cl. 528-11.000.
Frisch, Eldon E., 4,100,246, Cl. 264-230.000.

Dowdflor Corporation: *See—*
McCann, Thomas J.; and Regan, Ernest E., 4,100,318, Cl. 428-159.000.

Dower, Ethell J., to Warren Automatic Tool Co. Method and apparatus for controlling a surging flow in a closed conduit. 4,099,536, Cl. 137-2.000.

Draftex Development AG: *See—*
Bright, Robert G., 4,099,765, Cl. 296-93.000.

Dreher, John L.; and Crocker, Richard E., to Chevron Research Company. Polyurea-based extreme pressure grease. 4,100,081, Cl. 252-25.000.

Dreibholz & Floering Limited: *See—*
Cornish, David John, 4,099,456, Cl. 99-638.000.

Dresser Europe, S.A.: *See—*
Askew, William, 4,099,787, Cl. 299-43.000.

Dresser Industries, Inc.: *See—*
Blackwell, Henry Wayne, 4,099,451, Cl. 92-241.000.

Dron, Sylvain Maurice; and Evrard, Gerard Maurice Gaspard, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA). Assembly of a magnet and a pole piece. 4,100,392, Cl. 219-121.0EM.

Dryden, Christopher Michael: *See—*
MacKellar, Jeremy Margreave; Dryden, Christopher Michael; and Brazendale, Peter Alan, 4,099,467, Cl. 102-217.000.

D'Silva, Themistocles D. J., to Union Carbide Corporation. Dioxane oxime compounds and pesticidal dioxane carbamoyloxime derivatives. 4,100,295, Cl. 424-278.000.

DuBois, Richard, to Wagner Electric Corporation. Vacuum fluorescent display device with circular polarizer. 4,100,455, Cl. 313-496.000.

Duca, William J., to American Induction Heating Corporation. Housing for an induction furnace. 4,100,365, Cl. 13-27.000.

Ducker, Frank Edward Mayhew: *See—*
Hunt, William Valentine; and Ducker, Frank Edward Mayhew, 4,099,276, Cl. 5-72.000.

Duffy, Michel Thomas: *See—*
Berkman, Samuel; Duffy, Michel Thomas; Kim, Kyong-Min; and Cullen, Glenn Wherry, 4,099,924, Cl. 23-273.0SP.

Duffy, William Thomas; and Lillis, William Joseph, to Motorola, Inc. Voltage to current converter circuit. 4,100,433, Cl. 307-229.000.

Dullinger, Karl, to Kronseder, Hermann. Conveying and reject apparatus for upright standing bottles. 4,099,621, Cl. 209-98.000.

Dumont, Claude: *See—*
Nedelec, Lucien; Frechet, Daniel; Dumont, Claude; and Kannengiesser, Marie-Helene, 4,100,278, Cl. 424-244.000.

Dumont, Louis: *See—*
Clapot, Claude; Vial, Jean; and Dumont, Louis, 4,099,955, Cl. 71-98.000.

Dunks, Gary Burr; and Ordonez, Kathy Palmer, to Union Carbide Corporation. Carborane purification. 4,100,199, Cl. 260-606.50B.

Dunn, George T.: *See—*
Kutnyak, Thomas A.; and Dunn, George T., 4,099,744, Cl. 285-7.000.

Dunwald, Willi; Lewalter, Jurgen; Merten, Rudolf; and Muller, Hans-Jurgen, to Bayer Aktiengesellschaft. Process for the preparation of oligourethanes. 4,100,144, Cl. 260-860.000.

Dunwell, David William; Evans, Delme; and Hicks, Terence Alan, to Lilly Industries Ltd. 2,5 or 2,6-Disubstituted benzoxazoles. 4,100,168, Cl. 260-299.000.

Du Pont de Nemours, E. I., and Company: *See—*
Forsten, Herman Hans, 4,100,323, Cl. 428-280.000.
Smathers, Donald Lee, 4,100,360, Cl. 560-232.000.

Dupuy, Armand B.: *See—*
Valdois, Michel M.; and Dupuy, Armand B., 4,100,512, Cl. 331-158.000.

Durand, Henri; and Naaijer, Geert Jan, to U.S. Philips Corporation. Device for converting solar energy. 4,100,427, Cl. 307-87.000.

Durchholz, Richard F.: *See—*
Gregg, Richard; Weikel, James A.; Patel, Jayantilal M.; and Durchholz, Richard F., 4,100,306, Cl. 426-386.000.

DuRocher, Gideon A., to Essex Group, Inc. Combination insulating sleeve and electrical contact member for electro-plating rack. 4,100,054, Cl. 204-297.00W.

Dutta, Anand Swaroop; Furr, Barrington John Albert; and Giles, Michael Brian, to Imperial Chemical Industries Limited. Polypeptide. 4,100,274, Cl. 424-177.000.

Dwyer, Francis G., to Mobil Oil Corporation. Isomerization of monocyclic alkyl aromatic hydrocarbons. 4,100,214, Cl. 260-668.00A.

Dyball, Reginald Gordon. Attachment for a power tool. 4,099,552, Cl. 144-134.00D.

Dybas, Richard A.: *See—*
Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,100,193, Cl. 260-563.00P.

Dykes, Wiley V.; and Oharek, Frank J., to United States of America, Navy. 360° Non-programmed visual system. 4,100,571, Cl. 358-87.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Wissinger, Waldemar; and Gauchel, Peter, 4,100,243, Cl. 264-171.000.

E.D. Rode KG: *See—*
Rode, Ernst-Dietrich; and Winkler, Hans-Georg, 4,100,036, Cl. 204-14.00R.

E. R. Squibb & Sons, Inc.: *See—*
Breuer, Hermann; and Treuner, Uwe D., 4,100,344, Cl. 544-21.000.

Breuer, Hermann; and Treuner, Uwe D., 4,100,345, Cl. 544-21.000.
E Z Paintr: *See—*
Van Zeeland, Gerald D., 4,100,007, Cl. 156-86.000.
Easterday, Richard Lee: *See—*
Andren, Lars-Goran Hjalmar; Bjorkman, Rune Harald; Easterday, Richard Lee; and Munktell, Hans Gosta, 4,099,882, Cl. 356-181.000.
Easterling, Gene B.: *See—*
Beckham, Joel M.; Easterling, Gene B.; Ringel, Reginald K.; and Wolff, Egon E., 4,099,577, Cl. 172-781.000.
Eastman Kodak Company: *See—*
Abel, Frank Bernard, 4,099,861, Cl. 355-15.000.
Connin, John L., 4,099,860, Cl. 355-14.000.
De Baker, Joseph R.; and Spaller, Albert E., Jr., 4,099,679, Cl. 242-18.0PW.
Maggiulli, Cataldo Aldino; Burness, Donald MacArthur; and Perkins, William Clarence, 4,100,200, Cl. 260-609.00R.
Eberle, William J., to General Battery Corporation. Automatic air leak testing apparatus and method for batteries. 4,099,404, Cl. 73-45.200.
Ebner, Peter R., to Itek Corporation. Protective container for font disc segments. 4,099,618, Cl. 206-454.000.
ECO Industries, Inc.: *See—*
Oakley, Ervin Carvis; Bell, George Robert; and Poole, William Eugene, 4,099,808, Cl. 312-138.00R.
Eder, Ulrich: *See—*
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,026, Cl. 195-51.00G.
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,027, Cl. 195-51.00G.
Edgcombe, Christopher John, to English Electric Valve Company Limited. Velocity modulation tubes employing harmonic bunching. 4,100,457, Cl. 315-5.510.
Edmond, James Junior, to Bendix Corporation, The. Multi-axis load cell with arcuate flexures. 4,099,409, Cl. 73-133.00R.
Eggenberger, John Scott; and Patel, Arvind Motibhai, to International Business Machines Corporation. Method and means for discriminating between systematic and noise-induced error in data extracted from word organized memory arrays. 4,100,403, Cl. 235-312.000.
Eggermont, Ludwig D. J.: *See—*
Boudewijns, Henricus P. J.; Riemens, Karel; and Eggermont, Ludwig D. J., 4,100,494, Cl. 325-38.00B.
Ehlers, Klaus-Peter; Lischka, Siegfried; and Burkhardt, Siegfried, to Hoechst Aktiengesellschaft. Production of pure alkali metal phosphate solutions from wet-processed phosphoric acid. 4,100,261, Cl. 423-309.000.
Ehrlich, Robert L., to Colgate-Palmolive Company. Detergent compositions and washing methods including and utilizing separate tablets of components. 4,099,912, Cl. 8-137.000.
Eickholt, Hubert; and Heinzel, Gunter, to Polysius AG. Separator. 4,100,061, Cl. 209-139.00A.
Elberg, Anton J., to Husky Industries Inc. Process for carbonizing lignite coal. 4,100,032, Cl. 201-27.000.
Electric Power Research Institute: *See—*
Netzel, Philip C., 4,100,367, Cl. 174-28.000.
Electro-Therm, Inc.: *See—*
Vogel, Alan D., 4,099,319, Cl. 29-611.000.
Eli Lilly and Company: *See—*
Dillard, Robert D.; and Pavey, Donald E., 4,100,280, Cl. 424-246.000.
Shields, James E., 4,100,117, Cl. 260-8.000.
Zimmerman, Dennis M.; and Marshall, Winston S., 4,100,166, Cl. 260-289.00D.
Elliot, George: *See—*
Wisbey, Philip Henry; and Elliot, George, 4,099,855, Cl. 350-333.000.
Elliott Brothers (London) Limited: *See—*
Ellis, Stafford Malcolm, 4,099,841, Cl. 350-173.000.
Ovenden, Charles William, 4,100,464, Cl. 315-397.000.
Toome, Edward James, 4,099,696, Cl. 248-358.00R.
Ellis, Stafford Malcolm, to Elliott Brothers (London) Limited. Head up displays using optical combiner with three or more partially reflective films. 4,099,841, Cl. 350-173.000.
Elmqvist, Rune; and Almgren, Bertil, to Siemens Aktiengesellschaft. Liquid jet recorder. 4,100,550, Cl. 346-140.00R.
Elscint Ltd.: *See—*
Inbar, Dan; and Klein, Yitzhak, 4,100,413, Cl. 250-366.000.
Elsholz, Joachim; Bortfeld, Manfred; Maertz, Josef; and Poser, Erhard, to Bayerische Motoren Werke Aktiengesellschaft. Safety device for automobile occupants. 4,099,770, Cl. 297-216.000.
Elston, Lewis W., to Georgia Tech Research Institute. Regenerative method for quantitative removal of sulfur dioxide from stack gases. 4,100,260, Cl. 423-242.000.
Emberson, John Ernest. Thermoplastic article having accessible wall cavities therein for reception and retention of securing means. 4,099,274, Cl. 4-286.000.
Emil Bender, Firma: *See—*
Bender, Ulrich, 4,099,309, Cl. 29-2.000.
Emmerich, Kenneth C., to Fansteel Inc. Roof drilling system. 4,099,585, Cl. 175-320.000.
Emmons, William D.; Sperry, Peter R.; and Nyi, Kayson, to Rohm and Haas Company. Air-dry curable compositions comprising dicyclopentenyl (meth) acrylate copolymers and non-volatile reactive monomer, and cured coatings and impregnations obtained therefrom. 4,100,133, Cl. 260-45.90L.
Enchelmaier, Harvard W. K. Cylindrical wound brush. 4,099,287, Cl. 15-182.000.
Endo, Hajime: *See—*
Nakajima, Shigeo; and Endo, Hajime, 4,099,786, Cl. 299-43.000.
Sawayama, Isao; and Endo, Hajime, 4,099,781, Cl. 299-1.000.
Energy Development Associates: *See—*
Carr, Peter, 4,100,332, Cl. 429-27.000.
Energy Sciences Inc.: *See—*
Frutiger, William A.; and Overberg, David E., 4,100,450, Cl. 313-360.000.
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Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,100,458, Cl. 315-39.550.
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Tocquet, Bernard, 4,100,527, Cl. 340-10.000.
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Brois, Stanley J., 4,100,187, Cl. 260-502.500.
Sartori, Guido; and Lundberg, Robert D., 4,100,128, Cl. 260-33.6UA.
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Christenson, Christopher P.; Faller, John W.; and McNamee, Gary M., 4,100,183, Cl. 260-438.100.
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Decker, Donald H.; Davis, William R.; and Falleti, Duane W., 4,099,520, Cl. 128-2.00F.

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Farnbach, William A., to Hewlett-Packard Company. Digital pattern triggering circuit. 4,100,532, Cl. 340-146.3MA.
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Fathauer, George H.; Mathis, Cecil Ernest; and Williamson, Warren L., to Masco Corporation of Indiana. Selective rescan delay for multichannel scanning radio receiver. 4,100,497, Cl. 325-470.000.
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Feibelman, Jeffrey A., to A. & H. Mfg. Co. Jewelry display device. 4,099,611, Cl. 206-45.140.
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Schaefer, Peter; Mason, Peter Alan; and Yates, William Harold, 4,100,142, Cl. 526-68.000.
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Wistinghausen, Nikolai K.; and Banninga, Edward P., 4,099,363, Cl. 53-124.00D.
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Thomas, John Stuart, 4,099,948, Cl. 65-1.000.
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Bickl, Horst; Findeis, Gunter; Treiber, Helmut; and Zahn, Wolfgang, 4,099,862, Cl. 355-35.000.
Finley, Joseph H., to FMC Corporation. Process of producing dextrin carboxylates. 4,100,342, Cl. 536-103.000.
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Fischer, Charles F., to Colgate-Palmolive Company. Apparatus for high intensity shear refining of soap. 4,100,618, Cl. 366-297.000.
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, to BASF Aktiengesellschaft. 4-(m,m'-Di-t-butyl-p-hydroxyphenyl)-butyl-2-diamides. 4,100,191, Cl. 260-557.00R.
Fischer, William; and Rogge, Virgil D., to Chevron Research Company. Open bottom float tension riser. 4,099,560, Cl. 166-0.500.
Fischler, Hans-Michael; Bauer, Dieter; and Quast, Hein, to Bayer Aktiengesellschaft. Process for preparing diphenylamine in the presence of a boron/fluorine compound and water. 4,100,195, Cl. 260-576.000.
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Flanagan, James Loton, to Bell Telephone Laboratories, Incorporated. Packet transmission of speech. 4,100,377, Cl. 179-15.0AS.
Flautt, Thomas Joseph, Jr., to Procter & Gamble Company, The. Multi-ply tissue product. 4,100,017, Cl. 162-111.000.
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Gibbons, Harold M., 4,099,542, Cl. 137-615.000.
Hiszpanski, Jan A., 4,099,290, Cl. 15-340.000.
Mortensen, Donald G.; and Strand, Dennis P., 4,099,940, Cl. 55-300.000.
Peake, Clinton Joseph; Harnish, Wayne Nelson; and Davidson, Bruce Lloyd, 4,100,281, Cl. 424-246.000.
Foley, Newman Clarence, to N.B.F. Company, Inc. Hitching apparatus. 4,099,739, Cl. 280-504.000.
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Haas, Ronald J.; and Briggs, Donald D., 4,100,333, Cl. 429-156.000.
Ford Motor Company: *See*—
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Foris, Peter L.; Brown, Robert W.; and Phillips, Paul S., Jr., to NCR Corporation. Capsule manufacture. 4,100,103, Cl. 252-316.000.
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Danel, Francois Henri Paul, 4,100,553, Cl. 354-64.000.
Forsten, Herman Hans, to Du Pont de Nemours, E. I., and Company. Scrimless filter felt. 4,100,323, Cl. 428-280.000.
Forster, Brian Michael, to GKN Transmissions Limited. Wheel alignment testing apparatus. 4,099,333, Cl. 33-203.120.
Forster, Friedrich M. O. Harmonic magnetic field probe with novel core construction. 4,100,492, Cl. 324-254.000.
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Foster-Pegg, Richard W., to Westinghouse Electric Corp. Gasifier-combined cycle plant. 4,099,374, Cl. 60-39.120.
Foster Wheeler Energy Corporation: *See*—
Stevens, William D.; and Gorzegno, Walter P., 4,099,384, Cl. 60-657.000.
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Fowler, Joe: *See*—
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Francel, Josef; King, James E.; and Woulbroun, John M., to Owens-Illinois, Inc. Sealing glass vehicle and composition and method for making same. 4,099,977, Cl. 106-53.000.
Frankenhauser, Georg: *See*—
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Frankle, Helmut; and Baum, Werner, to Pei, Inc. Flame jet tool for drilling to great depths. 4,099,584, Cl. 175-14.000.
Franklin, Earl W., to Owens-Illinois, Inc. Thermally crystallizable glasses and glass-ceramics made therefrom. 4,100,001, Cl. 106-39.700.
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Frederick, Leonard L.; and Greigg, Edwin E. Sheet steel pile clamp. 4,099,387, Cl. 61-63.000.
Freeman, Robin John, to Vision Engineering, Ltd. High magnification optical apparatus with rotatable reflective lenticulated surface. 4,099,831, Cl. 350-9.000.
Freitag, Dieter; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Flame-resistant polycarbonates. 4,100,130, Cl. 260-37.0PC.
French, William George; and MacChesney, John Burnette, to Bell Telephone Laboratories, Incorporated. Optical fibers with helical gradations in composition. 4,099,835, Cl. 350-96.300.
Frenette, Lionel G., to Guertin, Victor T., Trustee. Instant load release method. 4,099,636, Cl. 214-152.000.
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Carlisle, Arthur Wallace; and Frey, Dean Rudisill, 4,099,822, Cl. 339-98.000.
Friedrich, Adolf: *See*—
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Friello, Dominick R.; and Roy, Raymond L., to Life Savers, Inc. Chewing gum containing non-dusting colors and method. 4,100,301, Cl. 426-3.000.
Frisch, Eldon E., to Dow Corning Corporation. Method of forming a gastrointestinal tube. 4,100,246, Cl. 264-230.000.
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Frohlich, Alfons; and Passmann, Walter, to OPTI Patent- Forschungs- und Fabrikations-AG. Slide fastener. 4,099,302, Cl. 24-205.15R.
Frutiger, William A.; and Overberg, David E., to Energy Sciences Inc. Method of and apparatus for generating longitudinal strips of energetic electron beams. 4,100,450, Cl. 313-360.000.

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Fuji Xerox Co., Ltd.: *See*—
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Fujino, Masahiko; Nishimura, Osamu; Nagawa, Yuji; and Fukuda, Naohisa, to Takeda Chemical Industries, Ltd. Peptides. 4,100,152, Cl. 260-112.5TR.
Fujisaki, Yoshinori, to Yoshida Kogyo K.K. Slide fastener combination. 4,099,301, Cl. 24-205.00R.
Fujita, Hiroo; Tsuzuki, Akira; and Morokawa, Shigeru, to Citizen Watch Co., Ltd. Method of driving liquid crystal matrix display device to obtain maximum contrast and reduce power consumption. 4,100,540, Cl. 340-324.00M.
Fukuda, Naohisa: *See*—
Fujino, Masahiko; Nishimura, Osamu; Nagawa, Yuji; and Fukuda, Naohisa, 4,100,152, Cl. 260-112.5TR.
Fukuhara, Masao, to Fukuhara Needle Co., Ltd. Latch knitting needle and method of making same. 4,099,391, Cl. 66-121.000.
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Fukuhara, Masao, 4,099,391, Cl. 66-121.000.
Fukusaki, Hiroshi; Niki, Masao; and Yokota, Yukinaga, to Kao Soap Co., Ltd. Process for preparation of grafted unsaturated polyester liquid resin dispersion. 4,100,127, Cl. 260-29.6NR.
Fulkerson, Melvin A., to Hammer Industries Inc. Device for automatically testing fluid absorption rates of soil. 4,099,406, Cl. 73-73.000.
Fuller, David Lee, to Scripto, Inc. Ignition mechanism for a pyrophoric lighter. 4,099,907, Cl. 431-254.000.
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Dutta, Anand Swaroop; Furr, Barrington John Albert; and Giles, Michael Brian, 4,100,274, Cl. 424-177.000.
Fussa, Alfred D.: *See*—
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G. A. Serlachius Oy: *See*—
Ashorn, Theodore Heinrich Gustave; and Laine, Paul Elis, 4,100,155, Cl. 260-124.00R.
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Gaffar, Abdul, to Colgate-Palmolive Company. Antibacterial oral composition. 4,100,270, Cl. 424-54.000.
Gainer, Gordon C.; and Luck, Russell M., to Westinghouse Electric Corp. Extrudable lubricant wicking material. 4,099,805, Cl. 308-240.000.
Galantay, Eugene E., to Sandoz, Inc. P-(substituted and unsubstituted-phenyl)-1-phenyl-2,3-butadien-1-ols as pharmaceutical agents. 4,100,300, Cl. 424-343.000.
Gale, George Martin, to United Kingdom Atomic Energy Authority. Purification of water by reverse osmosis using a supported semi-permeable membrane. 4,100,064, Cl. 210-23.00H.
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Gallant, John Henry; and Johnson, Michael Robert Thomas, to May & Baker Limited. Measuring system. 4,100,542, Cl. 340-518.000.
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Gange, Robert Allen, to RCA Corporation. Uniform filament and method of making the same. 4,100,449, Cl. 313-337.000.
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Brewer, John C., 4,099,678, Cl. 241-243.000.
Gardner-Denver Company: *See*—
Senior, Robert B.; and Karasinski, Frederick, 4,099,428, Cl. 81-9.510.
Gardner, Helen J.; and Gardner, Samuel M., to Hindu Incense. Incense product. 4,099,916, Cl. 21-116.000.
Gardner, Samuel M.: *See*—
Gardner, Helen J.; and Gardner, Samuel M., 4,099,916, Cl. 21-116.000.
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Garsky, Victor M., to American Home Products Corporation. (D-Trp^8)-somatostatin and analogues thereof. 4,100,153, Cl. 260-112.50S.
Garvin, Donald F.; and Aepli, Otto T., to BASF Wyandotte Corporation. Process for cleaning greasy surfaces with a heat dependent alkali gel. 4,099,985, Cl. 134-4.000.
Garza, Roque Villareal. Tumbler pin-type cylinder lock. 4,099,395, Cl. 70-360.000.
Gates Rubber Company, The: *See*—
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,099,401, Cl. 72-147.000.
Gatzi, Karl, to Ciba-Geigy Corporation. Pyridine-4-carboxylic acid hydrazones for combatting phytopathogenic microorganisms. 4,100,290, Cl. 424-266.000.
Gauchel, Peter: *See*—
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Gavioli, Roberto: *See*—
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Gawrilow, Ilija, to SCM Corporation. Pizza-like snack food dry mix and process for making same. 4,100,308, Cl. 426-554.000.
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Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, to Champion Products Inc. Apparatus for applying flock to a substrate. 4,099,485, Cl. 118-301.000.
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Eberle, William J., 4,099,404, Cl. 73-45.200.
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General Electric Company: *See*—
Anderson, Thomas E.; Peak, Steven C.; and Ibsen, Ole N., 4,100,587, Cl. 361-82.000.
Beers, Melvin D., 4,100,129, Cl. 260-37.0SB.
Boyd, John H., Jr., 4,100,444, Cl. 310-184.000.
Chipner, Russell W.; and Graff, James C., 4,100,448, Cl. 313-318.000.
Ferro, Armand P.; and Kurz, Bruno F., deceased, 4,099,998, Cl. 148-187.000.
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McNeal, Walter P., 4,100,005, Cl. 156-73.100.
Spauschus, Hans O.; and Loeb, Leopold, 4,100,092, Cl. 252-70.000.
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General Electric Company Limited, The: *See*—
Baker, Howard Burgess, 4,099,325, Cl. 29-741.000.
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George, Peter K., to Rockwell International Corporation. Exchange stack buffer memory. 4,100,608, Cl. 365-2.000.
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Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, to Hoffmann-La Roche Inc. Dibenz[b,f]oxepin derivatives. 4,100,173, Cl. 260-333.000.
Geringer, Arthur V. Electric lock. 4,099,752, Cl. 292-144.000.
Gerkema, Jan T.: *See*—
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Getman, Harlan R., to Vroman Foods, Inc. Method for producing and processing frozen confections. 4,100,304, Cl. 426-281.000.
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Ghiringhelli, Horace, to Isodyne, Inc. Single secondary dimming inverter/ballast for gas discharge lamps. 4,100,476, Cl. 315-297.000.
Giardini, Dante S.; and Hamburg, Douglas R., to Ford Motor Company. Vapor temperature controlled exhaust gas heat exchanger. 4,099,499, Cl. 123-122.00E.
Gibbons, Harold M., to FMC Corporation. Marine loading arm jumper assembly. 4,099,542, Cl. 137-615.000.
Gibson, Larry R. Foot warmer. 4,099,341, Cl. 36-7.300.
Gielens, Wilhelmus Adrianus Jacobus: *See*—
van der Wal, Johannes; Gielens, Wilhelmus Adrianus Jacobus; and Pasmans, Johannes Maria Marinus, 4,099,840, Cl. 350-166.000.
Giglia, Robert Domenico, to American Cyanamid Company. Faster addressing of electrochromic displays. 4,099,839, Cl. 350-357.000.
Giles, Michael Brian: *See*—
Dutta, Anand Swaroop; Furr, Barrington John Albert; and Giles, Michael Brian, 4,100,274, Cl. 424-177.000.
Gilles, Theodore C.: *See*—
Burnham, Roger R.; Chapin, Merlin K.; Cook, David A.; Gilles, Theodore C.; and Williams, Billy L., 4,099,553, Cl. 165-22.000.
Gillette Company, The: *See*—
Kunimi, Yuri, 4,100,397, Cl. 219-512.000.
Gilligan, Patrick J.; and Schrupp, Kenneth D., to Pako Corporation. Light source for photographic printer. 4,099,864, Cl. 355-37.000.
Gillis, Robert E. Concave-convex structure with spaced fittings for intersecting flexible rods. 4,099,533, Cl. 135-3.00E.
Gimenez, Aurelio Helde. Self tightening elastic clamp, particularly a hose clamp. 4,099,298, Cl. 24-27.000.

Giovenco, Silvia: *See—*
Prosperi, Giulio; Marconi, Walter; Giovenco, Silvia; and Morisi, Franco, 4,100,029, Cl. 195-68.000.

Giron, Jacques Pierre Max, to Scolarma. Method of and apparatus for molding a receptacle. 4,100,249, Cl. 264-313.000.

GKN Sankey Limited: *See—*
Shead, Terence Humphrey Charles; Hart, Frederick Leslie; and Sharp, Herbert John, 4,100,247, Cl. 264-271.000.

GKN Transmissions Limited: *See—*
Forster, Brian Michael, 4,099,333, Cl. 33-203.120.

Glacier Metal Company, Limited, The: *See—*
Baker, Dennis Stanley; and Davies, Glyndwr John, 4,099,804, Cl. 308-237.00R.

Glanvall, Rune Valdemar, to Stal Refrigeration AB. Rotary compressor. 4,099,896, Cl. 418-184.000.

Glenro, Inc.: *See—*
Ballard, Jules, 4,100,395, Cl. 219-356.000.

Glickler, Sheldon L.; and DeBaryshe, Paul G., to Jersey Nuclear-AVCO Isotopes, Inc. Low distortion mirror for high power laser beams including a rear reflective surface. 4,099,853, Cl. 350-310.000.

Glock, Robert D.; Harris, Delbert L.; and Schwartz, Kent J., to Iowa State University Research Foundation, Inc. Method of increasing the resistance of swine to swine dysentery infection. 4,100,272, Cl. 424-92.000.

Go, Santos W., to Owens-Illinois, Inc. Isophthalic acid/P,P-sulfonyldibenzoic acid/ethylene glycol/neopéntyl glycol polyester compositions and containers made therefrom. 4,100,303, Cl. 426-106.000.

Goetzl, Horst; Grassme, Ulrich; and Seissl, Johannes, to Siemens Aktiengesellschaft. Dental X-ray diagnostic device. 4,100,417, Cl. 250-505.000.

Goff, McKinley: *See—*
Crum, Donald; Goff, McKinley; and Hampton, Edward L., 4,099,776, Cl. 297-329.000.

Goffinet, Pierre: *See—*
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,557, Cl. 165-104.00S.
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,558, Cl. 165-104.00S.

Golconda Corporation: *See—*
Billington, Evans R.; and Nicholas, William, 4,099,551, Cl. 141-388.000.

Gold, Nicholas: *See—*
Wareham, Richard R.; and Gold, Nicholas, 4,100,559, Cl. 354-277.000.

Gold, Richard G.: *See—*
MacRae, Donald R.; Gold, Richard G.; Sandall, William R.; and Thompson, Charles D., 4,099,958, Cl. 75-0.5BA.

Goldberg, Gerald; and Kaufman, Paul Richard, to Borg-Warner Corporation. Stabilization of nitrile resins with half acid salts of maleic acid. 4,100,126, Cl. 260-29.6AQ.

Goldner, Walther, to Recaro GmbH & Co. Vehicle head support. 4,099,779, Cl. 297-408.000.

Goloff, Alexander; and Keske, Frank E., to Caterpillar Tractor Co. Fuel spray. 4,099,494, Cl. 123-32.0JV.

Gonzales, Boris, to Societe Anonyme Automobiles Citroen. Speed limiter devices for automobiles. 4,099,592, Cl. 180-108.000.

Goodwin, Thomas E.; and Starks, Charles M., to Continental Oil Company. Preparation of methyl-substituted phenols. 4,100,207, Cl. 568-804.000.

Goodyear Tire & Rubber Company, The: *See—*
Hampshire, William J., 4,100,241, Cl. 264-113.000.

Goold, Reed: *See—*
Wojcik, Bruce C.; Herrett, Wilfred H.; Cooper, Gerald D.; Goold, Reed; and Wojcik, Charles W., 4,100,042, Cl. 204-105.00R.

Gordon, Gerald A.; and Josephy, Karl, to Continental Group, Inc., The. Method of preparing micron size particles of solid polymers. 4,100,236, Cl. 264-8.000.

Gorokhov, Veniamin Ivanovich: *See—*
Belyshev, Leonid Lavrentievich; Gorokhov, Veniamin Ivanovich; and Chuvpilo, Albert Vladimirovich, 4,099,549, Cl. 141-32.000.

Gorter, Frederik W.: *See—*
Koel, Gerrit J.; Gorter, Frederik W.; and Gerkema, Jan T., 4,100,583, Cl. 360-113.000.

Gorzegno, Walter P.: *See—*
Stevens, William D.; and Gorzegno, Walter P., 4,099,384, Cl. 60-657.000.

Gosswiller, Earl W., to Federal Signal Corporation. Supervisory circuit for monitoring speaker coils. 4,100,380, Cl. 179-175.10A.

Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., to Bristol-Myers Company. Certain 7(o-amino-methyl- or methylaminomethylphenyl- or cyclohexadienyl- or thienylacetamide)-3[1-carboxymethyl-(or ethyl- or propyl-)-tetrazol-5-ylthiomethyl]-3-cephem-4-carboxylic acids. 4,100,346, Cl. 544-27.000.

Gould, Allan Victor Stewart, to Thorn Electrical Industries Limited. Suppression of color fringing in lamps. 4,100,594, Cl. 362-308.000.

Gould Inc.: *See—*
Kirsch, Thomas, 4,100,524, Cl. 338-2.000.

Gournay, Luke S., to Mobil Oil Corporation. Hydrocarbon exploration with display of re-radiated and reflected microwave energy. 4,100,481, Cl. 324-4.000.

Grace, Wesley R.: *See—*
Chen, Chieh Y.; and Grace, Wesley R., 4,099,530, Cl. 128-419.0PT.

Graff, James C.: *See—*
Chipner, Russell W.; and Graff, James C., 4,100,448, Cl. 313-318.000.

Graham, Hubert P., to Alcan Aluminum Corporation. Seamed rib panel assembly. 4,099,356, Cl. 52-520.000.

Granatek, Alphonse P.: *See—*
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 4,100,346, Cl. 544-27.000.

Grandadam, Jean Andre; and Heurtaux, Simone, to Roussel Uclaf. Novel anti-acarid methods. 4,100,297, Cl. 424-304.000.

Grandeur Motorcar Corp.: *See—*
Phillips, Charles Walter, 4,099,313, Cl. 29-416.000.

Granges Essem Aktiebolag: *See—*
Paitula, Hannu Olli, 4,099,685, Cl. 242-107.40B.

Graphic Controls Corporation: *See—*
Hubbard, James R., 4,100,549, Cl. 346-140.00A.

Graphics Equipment International Corporation: *See—*
Boyer, Harold E.; and Trisler, Jerry V., 4,099,710, Cl. 270-68.00A.

Grassme, Ulrich: *See—*
Goetzl, Horst; Grassme, Ulrich; and Seissl, Johannes, 4,100,417, Cl. 250-505.000.

Grasso, Giuseppe: *See—*
Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, 4,100,264, Cl. 423-430.000.

Graube, Andrejs, to Hughes Aircraft Company. Method for fabricating reflection infrared holograms. 4,099,971, Cl. 96-27.00H.

Greer Hydraulics, Inc.: *See—*
Zahid, Abduz, 4,099,545, Cl. 138-30.000.

Gregg, Richard, to Procter & Gamble Company, The. Method of making an improved coffee volatiles concentrate. 4,100,305, Cl. 426-385.000.

Gregg, Richard; Weikel, James A.; Patel, Jayantilal M.; and Durchholz, Richard F., to Procter & Gamble Company, The. Method of making an improved instant coffee. 4,100,306, Cl. 426-386.000.

Greigg, Edwin E.: *See—*
Frederick, Leonard L.; and Greigg, Edwin E., 4,099,387, Cl. 61-63.000.

Greiner, Bernd: *See—*
Quietzsch, Gerhard; Greiner, Bernd; and Pelz, Lothar, 4,100,488, Cl. 324-127.000.

Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., to Merck & Co., Inc. Novel dibicyclo [2.2.2] octyl and dibicyclo [2.2.2] octenyl polyamines and methods for their preparation. 4,100,193, Cl. 260-563.00P.

Grier, William R.: *See—*
Gubelmann, William S., deceased; and Grier, William R., 4,099,606, Cl. 400-4.000.

Griffin, William W., Jr.; and Pierce, Robert M., to United States of America, Air Force. Vented igniter. 4,099,373, Cl. 60-39.670.

Grill, Michael: *See—*
Grohmann, Helmut; and Grill, Michael, 4,100,254, Cl. 423-163.000.

Grimaldi, David C., Jr. Adjustable pneumatic power driving apparatus. 4,099,659, Cl. 227-130.000.

Grisar, Ulrich; and Berstermann, Wilhelm, to Klockner-Werke AG. Arrangement for the spectral analysis of substances. 4,099,873, Cl. 356-86.000.

Grody, Donald R.; and Fitzpatrick, Donald C., to Lenox Machine Company. Divider for stacker mechanism. 4,099,711, Cl. 271-64.000.

Groetschel, Karl Maria. Method and apparatus for supporting the roof of an underground mine working. 4,099,785, Cl. 299-11.000.

Groff, Eugene R., to Caterpillar Tractor Co. Vibration damped shoe assembly. 4,099,796, Cl. 305-46.000.

Groff, Russell Dennis; and Vatovec, Richard John, to United States of America, Energy. Nozzle seal. 4,100,019, Cl. 176-50.000.

Grohmann, Helmut; and Grill, Michael, to Veitscher Magnesitwerke-Actien-Gesellschaft. Industrial process of preparing magnesia of high purity. 4,100,254, Cl. 423-163.000.

Groothuis, Hermanus Hubertus Hendrikus, to U.S. Philips Corporation. Facsimile system. 4,100,580, Cl. 358-260.000.

Grosch, Gerhard: *See—*
Born, Gunthard; Hermansdorfer, Hans; Sepp, Gunther; and Grosch, Gerhard, 4,100,507, Cl. 331-94.50G.

Grove, Charles H.: *See—*
United States of America, National Aeronautics and Space Administration; Wojtasinski, Ronald J.; Fuchs, Jerry C.; and Grove, Charles H., 4,100,487, Cl. 324-96.000.

Groves, Ian Stanley: *See—*
Cooper, Kenneth; Groves, Ian Stanley; Leigh, Peter Alexander; McIntyre, Neil; O'Hara, Sydney; and Speight, John Donald, 4,099,318, Cl. 29-578.000.

Grunwald, John J.: *See—*
Lombardo, Michael S.; Jacovich, Elaine F.; D'Ottavio, Eugene D.; and Grunwald, John J., 4,100,312, Cl. 427-96.000.

Grupo Industrial Alfa, S.A.: *See—*
MacKay, Patrick W.; Vera, Enrique Martinez; and de la Pena, Ramon, 4,099,962, Cl. 75-26.000.

Grzesik, Michel Edouard, to Societe Anonyme POCLAIN. Endless track for vehicle. 4,099,797, Cl. 305-54.000.

GTE Sylvania Incorporated: *See—*
Blaisdell, Ronald G.; and Hough, Harold L., 4,100,415, Cl. 250-455.000.
Brennan, Leon E.; Lagermasini, Joseph P.; and Rarig, Larry L., 4,099,607, Cl. 198-341.000.
DiTullio, Joseph G.; and Parad, Leonard I., 4,100,514, Cl. 333-31.00A.
Henkel, Charles E.; and Holmes, C. Daniel, 4,100,592, Cl. 362-191.000.
Messier, Russell F.; and Wolfe, Robert W., 4,100,101, Cl. 252-301.40H.

Gubelmann, Walter S., executor: *See—*
Gubelmann, William S., deceased; and Grier, William R., 4,099,606, Cl. 400-4.000.

Gubelmann, William S., deceased (by Gubelmann, Walter S., executor); and Grier, William R., to Realty & Industrial Corporation. Justifying text writing reproducing machine. 4,099,606, Cl. 400-4.000.

Guerit, Pierre: *See—*
Beguin, Jean Claude; and Guerit, Pierre, 4,099,965, Cl. 75-68.00R.

Guertin, Victor T., Trustee: *See—*
Frenette, Lionel G., 4,099,636, Cl. 214-152.000.

Guilhem, Jacques R.; and Jean, Pierre, to Gaz-Transport. Apparatus for transporting fluids at low temperature. 4,099,649, Cl. 220-439.000.

Gunnell, Thomas J., to Phillips Petroleum Company. Carbon black pelleter. 4,099,899, Cl. 425-222.000.

Guntlow, Vincent T.: *See—*
Peck, David B.; Guntlow, Vincent T.; and Netherwood, Paul H., 4,100,490, Cl. 324-182.000.

Gupta, Shanti Swarup, to Wescom, Inc. Communication circuit having precision capacitor multiplier. 4,100,515, Cl. 333-80.00R.

Gurov, Evgeny Ivanovich: *See—*
Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.

Gustafsson, Ake; and Stark, Olof, to AB Ziristor. Method and an arrangement for the sterilization of packing material. 4,099,914, Cl. 21-57.000.

Gustavsson, Lennart, to Aktiebolaget Svenska Flaktfabriken. Method and apparatus for forming a material web. 4,099,296, Cl. 19-304.000.

Gutermuth, Paul; Oetjen, Heinrich; and Gutermuth, Paul, Jr. Condenser ceiling for kitchens. 4,099,941, Cl. 55-269.000.

Gutermuth, Paul, Jr.: *See—*
Gutermuth, Paul; Oetjen, Heinrich; and Gutermuth, Paul, Jr., 4,099,941, Cl. 55-269.000.

Guthrie, Robert M.: *See—*
Alcock, Richard A.; and Guthrie, Robert M., 4,099,403, Cl. 72-288.000.

Gutlhuber, Friedrich; Jager, Adolf; and Ufholz, Heinrich, to Deggendorfer Werft und Eisenbau G.m.b.H. Multistage reactor. 4,099,926, Cl. 23-286.000.

Gutteridge, Norman James Albert: *See—*
Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, 4,100,350, Cl. 560-20.000.

Gwozdz, Joseph W.; Biesecker, James E.; and Snyder, Charles R., to McKinney Manufacturing Company. Automatic locking mechanism for one of a pair of hinged doors. 4,099,753, Cl. 292-177.000.

Gyi, KoKo: *See—*
Behr, Michael Isaac; Gyi, KoKo; and Brutsch, Werner, 4,100,584, Cl. 360-125.000.

H & H Equipment Co.: *See—*
McGee, Donald J., 4,099,740, Cl. 280-678.000.

H.O.P. Consulab Inc.: *See—*
Delisle, Jules; Leroux, Adrien; and Mathieu, Serge, 4,100,428, Cl. 307-97.000.

Haag, Werner O.: *See—*
Chen, Nai Yuen; and Haag, Werner O., 4,100,218, Cl. 260-673.000.

Haake, Frederick L., to United States of America, Navy. Ignition device for missile motors. 4,099,465, Cl. 102-204.000.

Haas, Ronald J.; and Briggs, Donald D., to Ford Aerospace & Communications Corp. Battery structure. 4,100,333, Cl. 429-156.000.

Haas, Werner E. L.; and Dir, Gary A., to Xerox Corporation. Imaging composition. 4,100,088, Cl. 252-62.520.

Habermeier, Jurgen, to Ciba-Geigy Corporation. Triols containing hydantoin rings. 4,100,348, Cl. 548-310.000.

Hada, Hiroshi; and Hirayama, Tsutomu, to Nippon Electric Co., Ltd. Driving circuit for a gas discharge display panel. 4,100,461, Cl. 315-169.0TV.

Haddad, Daniel G., to Blodgett, Norman S., a part interest. Game racket. 4,099,716, Cl. 273-73.00E.

Haese, Egon, to Dr. C. Otto & Comp. G.m.b.H. Control system to regulate the wall temperature of a pressure vessel. 4,099,554, Cl. 165-32.000.

Hagar, Robert A.: *See—*
Suffredini, Joseph R.; and Hagar, Robert A., 4,100,445, Cl. 313-101.000.

Hagino, Shunji, to RCA Corporation. Turntable speed control system. 4,100,465, Cl. 318-41.000.

Haley, Jack R.: *See—*
Smith, Jimmy B.; and Haley, Jack R., 4,100,034, Cl. 201-39.000.

Hall, Michael John: *See—*
Atherton, Frank Ratcliffe; Hall, Michael John; Hassall, Cedric Herbert; Ringrose, Peter Stuart; and Lambert, Robert Wilson, 4,100,275, Cl. 424-211.000.

Hall, Roger D., to Bendix Corporation, The. Microwave circuit having grounding structure. 4,100,516, Cl. 333-6.000.

Halm, Hans, to Niveau AG, Firma. Index card register with selector device. 4,100,060, Cl. 209-80.500.

Hamburg, Douglas R.: *See—*
Giardini, Dante S.; and Hamburg, Douglas R., 4,099,499, Cl. 123-122.00E.

Hamilton, Willard C.: *See—*
Scouten, Charles G.; and Hamilton, Willard C., 4,099,968, Cl. 96-1.0SD.

Hamlet, Buck C.: *See—*
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,099,741, Cl. 280-712.000.

Hamlett, Sidney J.; and Bell, Charles M., to White Sewing Machine Company. Convertible open-arm sewing machine. 4,099,474, Cl. 112-258.000.

Hammad, Mohamed W.: *See—*
Kraskin, Kenneth S.; and Hammad, Mohamed W., 4,099,976, Cl. 106-15.00R.

Hammen, Philip D., to Pfizer Inc. 3,4-Dihydro-2-methyl-4-oxo-2H-1,2-benzothiazine-3-carboxylic acid-1,1-dioxide. 4,100,347, Cl. 544-49.000.

Hammer Industries Inc.: *See—*
Fulkerson, Melvin A., 4,099,406, Cl. 73-73.000.

Hammer, Jacob Meyer; and Neil, Clyde Carl, to RCA Corporation. Process for forming an optical waveguide. 4,100,313, Cl. 427-162.000.

Hampshire, William J., to Goodyear Tire & Rubber Company, The. Method for manufacturing curved bodies of fiber reinforced plastic. 4,100,241, Cl. 264-113.000.

Hampton, Edward L.: *See—*
Crum, Donald; Goff, McKinley; and Hampton, Edward L., 4,099,776, Cl. 297-329.000.

Hane, Teruaki: *See—*
Nakajima, Takayoshi; Sonoda, Hiroshi; Sasaki, Katsutoshi; and Hane, Teruaki, 4,100,009, Cl. 156-184.000.

Hansen, Ove; and Rasmussen, Stig, to A/S Niro Atomizer. Method of evaporating and spray drying of a sucrose solution. 4,099,982, Cl. 127-61.000.

Hanson, Wallace E., to Champion International Corporation. Display carton for lamp fixtures. 4,099,612, Cl. 206-45.190.

Harada, Katsuhito; Koizumi, Hideaki; and Oishi, Konosuke, to Hitachi, Ltd. Light source lamp with particular envelope structure to accommodate external magnets. 4,100,446, Cl. 313-161.000.

Hardouin, Jean Pierre, to Alcan Research and Development Limited. Sawing apparatus. 4,099,434, Cl. 83-157.000.

Hareng, Michel; and Le Berre, Serge, to Thomson-CSF. Thermo-optic liquid-crystal device for real-time display of animated images. 4,099,857, Cl. 350-351.000.

Harley, David N.: *See—*
Palmer, John P.; Clinch, Colin W.F.; and Harley, David N., 4,099,757, Cl. 292-336.300.

Harlin, Herbert, to Karl Harlin & Co. Pantograph copying attachment. 4,099,446, Cl. 90-13.100.

Harmon Colors: *See—*
North, Robert Jarl, 4,100,162, Cl. 260-279.0QA.

Harmon Colors Corporation: *See—*
North, Robert Jarl, 4,099,980, Cl. 106-288.00Q.

Harnish, Wayne Nelson: *See—*
Peake, Clinton Joseph; Harnish, Wayne Nelson; and Davidson, Bruce Lloyd, 4,100,281, Cl. 424-246.000.

Harris Corporation: *See—*
McGann, William E., 4,100,504, Cl. 331-39.000.
McGann, William Edward, 4,100,589, Cl. 361-399.000.
Perkins, Frank A., 4,100,373, Cl. 179-1.00C.
Straayer, Ronald Jack, 4,099,829, Cl. 350-6.100.

Harris, Delbert L.: *See—*
Glock, Robert D.; Harris, Delbert L.; and Schwartz, Kent J., 4,100,272, Cl. 424-92.000.

Harshaw Chemical Company, The: *See—*
Ashman, John Slocum; and Mudrak, Anton, 4,100,075, Cl. 252-8.100.
Ashman, John Slocum; Burt, Gerald Dennis; and Mudrak, Anton, 4,100,076, Cl. 252-8.100.
Burt, Gerald Dennis; and Mudrak, Anton, 4,100,077, Cl. 252-8.100.

Hart, Frederick Leslie: *See—*
Shead, Terence Humphrey Charles; Hart, Frederick Leslie; and Sharp, Herbert John, 4,100,247, Cl. 264-271.000.

Hart, John Peter: *See—*
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Hartig, Juergen: *See—*
Weitz, Hans-Martin; and Hartig, Juergen, 4,100,361, Cl. 560-244.000.

Hartig, Wolfgang: *See—*
Walther, Herbert; Hartig, Wolfgang; Friedrich, Adolf; and Raue, Roderich, 4,100,509, Cl. 331-94.50L.

Hartmann, Ludwig, to Maschinenfabrik Hellmut Geiger. Method and apparatus for the biological cleansing of waste water. 4,100,063, Cl. 210-17.000.

Hartwell Corporation: *See—*
Poe, Lloyd R.; and Sawyer, Frank L., 4,099,751, Cl. 292-139.000.

Hartzell, Robert Eugene, Jr., to Systron-Donner Corporation. Temperature compensation circuit for a fluid damped servo system. 4,099,415, Cl. 73-497.000.

Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, to Dai Nippon Toryo Co., Ltd. Low-velocity electron excited fluorescent display device. 4,100,454, Cl. 313-495.000.

Hasegawa, Junzo; Hayashi, Yasutaka; Suzuki, Yasuhiko; Katoh, Takashi; Tsunekawa, Takahiko; and Tanaka, Akira, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Method and apparatus for controlling the sliver-thickness variation in a carding machine. 4,099,297, Cl. 19-240.000.

Hashimoto, Eiichi: *See—*
Okura, Takao; Hashimoto, Eiichi; and Ohama, Yasumichi, 4,099,502, Cl. 123-122.0AC.

Hashimoto, Hideyuki, to Hitachi, Ltd. Ignition systems of current interruption type for internal combustion engines. 4,099,509, Cl. 123-148.0AC.

Hashimoto, Shunichi; and Mukai, Kunio, to Sumitomo Chemical Company, Limited. Amide phosphorothiolate herbicides. 4,099,954, Cl. 71-87.000.

Hassall, Cedric Herbert: *See*—
Atherton, Frank Ratcliffe; Hall, Michael John; Hassall, Cedric Herbert; Ringrose, Peter Stuart; and Lambert, Robert Wilson, 4,100,275, Cl. 424-211.000.

Hasselberger, John. Glove compartment shelf. 4,099,814, Cl. 312-317.00R.

Hasty, Jerry N., to MWA Company. Honing assembly. 4,099,350, Cl. 51-338.000.

Hattori, Tadashi: *See*—
Yasuda, Eturo; Sato, Susumu; Segawa, Yoshihiro; Hattori, Tadashi; and Aoki, Keiji, 4,099,922, Cl. 23-254.00E.

Hauk, Ernest D., to Service Equipment Design Co., Inc. Pipe-spinning apparatus and method. 4,099,429, Cl. 81-57.170.

Hauk, Ernest D.: *See*—
Hauk, Thomas D.; and Hauk, Ernest D., 4,099,405, Cl. 73-46.000.

Hauk, Thomas D.; and Hauk, Ernest D., to Service Equipment Design Co., Inc. Apparatus and method for testing pipes for leaks, and seals therefor. 4,099,405, Cl. 73-46.000.

Hausdorff, Harry H. Selective multichannel optical time-shared detector for chromatography. 4,100,412, Cl. 250-343.000.

Hawthorne, Horace Stanley, to Lucas Electrical Limited. Arch forms and a method of moulding same. 4,099,329, Cl. 32-2.000.

Hayashi, Josaburo: *See*—
Yajima, Seishi; Hayashi, Josaburo; and Omori, Mamoru, 4,100,233, Cl. 423-345.000.

Hayashi, Masao: *See*—
Yoshimura, Kiyoharu; and Hayashi, Masao, 4,100,265, Cl. 423-449.000.

Hayashi, Yasutaka: *See*—
Hasegawa, Junzo; Hayashi, Yasutaka; Suzuki, Yasuhiko; Katoh, Takashi; Tsunekawa, Takahiko; and Tanaka, Akira, 4,099,297, Cl. 19-240.000.

Heath, Allan B.; and Wolfe, Eugene E., to Acheson Industries, Inc. Spray gun device. 4,099,673, Cl. 239-415.000.

Heinemann, Otto; Schossler, Werner; Lucke, Helmut; Krumme, Helmut; and Heiringhoff, Burkhard, to Polysius AG. Hydrostatic bearing unit and a hydrostatic bearing assembly comprising several such bearing units. 4,099,802, Cl. 308-9.000.

Heinze, George E.: *See*—
Theimer, Ernst Theodore; and Heinze, George E., 4,100,302, Cl. 426-90.000.

Heinzel, Gunter: *See*—
Eickholt, Hubert; and Heinzel, Gunter, 4,100,061, Cl. 209-139.00A.

Heiringhoff, Burkhard: *See*—
Heinemann, Otto; Schossler, Werner; Lucke, Helmut; Krumme, Helmut; and Heiringhoff, Burkhard, 4,099,802, Cl. 308-9.000.

Heiss, Louis Robert, to Baxter Travenol Laboratories, Inc. Temperature control and stirring apparatus for luminescence measuring photometer. 4,099,920, Cl. 23-253.00R.

Heissenberger, Oswald, to Semperit Aktiengesellschaft. Package for a sterilized pair of gloves and method of forming the same. 4,099,614, Cl. 206-299.000.

Heitkamp, Herbert: *See*—
Husemann, Heinz; and Heitkamp, Herbert, 4,099,388, Cl. 61-85.000.

Hemmi, Christian Otto; Kesler, Oren Byrl; and Dover, Richard Thomas, to United States of America, Transportation. Bifocal pillbox antenna system. 4,100,548, Cl. 343-837.000.

Henderson, Kenneth James, to Shandon Southern Products Limited. Tissue processing apparatus. 4,099,483, Cl. 118-49.100.

Henery, Maurice D.; Snyder, Ernest B.; and Walker, Walter W., to Marblehead Lime Company. Recycling of iron values. 4,099,964, Cl. 75-52.000.

Henkel, Charles E.; and Holmes, C. Daniel, to GTE Sylvania Incorporated. Projection lighting assembly and lamp unit for use therein. 4,100,592, Cl. 362-191.000.

Henry, Clemence J.: *See*—
Savoit, Robert E.; and Henry, Clemence J., 4,099,915, Cl. 21-60.50A.

Herbein, Herbert H., to Ripple Twist Mills, Inc. Circular knitting machine. 4,099,389, Cl. 66-9.00R.

Hermansdorfer, Hans: *See*—
Born, Gunthard; Hermansdorfer, Hans; Sepp, Gunther; and Grosch, Gerhard, 4,100,507, Cl. 331-94.50G.

Herrett, Wilfred H.: *See*—
Wojcik, Bruce C.; Herrett, Wilfred H.; Cooper, Gerald D.; Goold, Reed; and Wojcik, Charles W., 4,100,042, Cl. 204-105.00R.

Herweh, John E., to Armstrong Cork Company. Surface modification of polymeric substrates via interaction with azido formyl or azido sulfonyl compounds. 4,099,910, Cl. 8-115.500.

Hess, Bernhard; Raichle, Karl; Bottenbruch, Ludwig; Schulz-Walz, Hansjochen; and Alberts, Heinrich, to Bayer Aktiengesellschaft. Stable organic dispersions which can be cured with little shrinkage, based on unsaturated polyester resins and thermoplastic polymers. 4,100,224, Cl. 260-862.000.

Hetzel, Donald S.: *See*—
Berg, Rudolph G.; and Hetzel, Donald S., 4,100,179, Cl. 260-346.750.

Heurtaux, Simone: *See*—
Grandadam, Jean Andre; and Heurtaux, Simone, 4,100,297, Cl. 424-304.000.

Hewitt Soap Company, Inc., The: *See*—
O'Roark, James R., 4,100,097, Cl. 252-145.000.

Hewlett-Packard Company: *See*—
Farnbach, William A., 4,100,532, Cl. 340-146.3MA.

Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, to Westinghouse Electric Corp. Process for the preparation of calcium carbonate for use in fluorescent lamp phosphors. 4,100,264, Cl. 423-430.000.

Hickner, Richard A.: *See*—
Bogan, Gary W.; and Hickner, Richard A., 4,100,045, Cl. 204-159.160.

Hicks, Alan A.; Brand, Derek A.; and Morrison, Howard J., to Marvin Glass & Associates. Vibratory drawing device. 4,099,330, Cl. 33-18.00R.

Hicks, Terence Alan: *See*—
Dunwell, David William; Evans, Delme; and Hicks, Terence Alan, 4,100,168, Cl. 260-299.000.

Higgerson, Raymond, to Automotive Products Limited. Friction clutch with integral adjuster. 4,099,604, Cl. 192-111.00A.

High Voltage Engineering Corporation: *See*—
Merrill, Edward W., 4,099,859, Cl. 351-160.000.

Higuchi, Shigetaka: *See*—
Somezawa, Masashi; Higuchi, Shigetaka; Shimizu, Tatsuo; and Ishibashi, Isao, 4,100,326, Cl. 427-130.000.

Hilfman, Lee, to UOP Inc. Hydroprocessing of hydrocarbons. 4,100,058, Cl. 208-264.000.

Hill, Colin Barry: *See*—
Moss, Maurice; Hill, Colin Barry; and Rowland, Michael Roger, 4,100,004, Cl. 156-60.000.

Hill, Harry Elwyn, to R. T. Vanderbilt Company, Inc. Stabilized polyolefin composition. 4,100,132, Cl. 260-42.460.

Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., to Ames Rubber Corporation. Elastomeric roll with sealed ends. 4,099,312, Cl. 29-130.000.

Hindman, Thomas Wayne, Sr.: *See*—
Jueckstock, Dale Allen; and Hindman, Thomas Wayne, Sr., 4,099,283, Cl. 10-107.0PH.

Hindu Incense: *See*—
Gardner, Helen J.; and Gardner, Samuel M., 4,099,916, Cl. 21-116.000.

Hipps, Larry W. Electro-hydraulic brake actuating system. 4,099,790, Cl. 303-7.000.

Hiraki, Minoru: *See*—
Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,100,454, Cl. 313-495.000.

Hirano, Kousaku: *See*—
Yamashita, Mitsura; Hirano, Kousaku; and Thai, Nguyen Dang, 4,100,482, Cl. 324-6.000.

Hirayama, Tsutomu: *See*—
Hada, Hiroshi; and Hirayama, Tsutomu, 4,100,461, Cl. 315-169.0TV.

Hirschfeld, Tomas R., to Block Engineering, Inc. Serum fluorescence suppression. 4,100,416, Cl. 250-461.00B.

Hiszpanski, Jan A., to FMC Corporation. Sweeper with recirculation hood having an unobstructed pickup window. 4,099,290, Cl. 15-340.000.

Hitachi Cable, Ltd.: *See*—
Takano, Hideo; Saito, Satoshi; Sato, Tadashi; Yamaguchi, Tuyoshi; and Narita, Yoshihiro, 4,099,897, Cl. 425-4.00C.

Hitachi Chemical Company, Ltd.: *See*—
Maekawa, Iwao; Uchigasaki, Isao; and Kumazaki, Sakato, 4,100,120, Cl. 260-22.0CB.

Hitachi, Ltd.: *See*—
Adachi, Yoshio, 4,100,429, Cl. 307-205.000.
Harada, Katsuhito; Koizumi, Hideaki; and Oishi, Konosuke, 4,100,446, Cl. 313-161.000.
Hashimoto, Hideyuki, 4,099,509, Cl. 123-148.0AC.
Hori, Yasuro, 4,100,521, Cl. 336-100.000.
Iyotani, Ryuji; Watanabe, Atsumi; Amano, Hisao; and Ogata, Fumio, 4,100,434, Cl. 307-252.00L.
Kato, Shigeo; Saito, Sakae; and Morita, Osamu, 4,099,348, Cl. 51-92.00R.
Komuro, Katsu, 4,100,435, Cl. 307-262.000.
Matsuzaki, Hideo; and Yajima, Keiji, 4,099,550, Cl. 141-51.000.
Miura, Kiyoshi; and Tomita, Yoshifumi, 4,099,973, Cl. 96-115.00R.
Miyakawa, Nobuaki; and Miki, Masayuki, 4,100,432, Cl. 307-229.000.
Morishita, Hirosada; Kawamoto, Mineo; Wajima, Motoyo; and Murakami, Kanji, 4,099,974, Cl. 106-1.230.
Naka, Reishi; Narahara, Toshikazu; and Mukai, Junji, 4,100,114, Cl. 521-175.000.
Nakagaki, Harushige; Sampei, Tohru; Amada, Nobutaka; and Baba, Tatsuo, 4,100,501, Cl. 330-263.000.
Nobutoki, Saburo; and Okano, Yukio, 4,100,570, Cl. 358-44.000.
Numata, Shun-ichi; Yokono, Hitoshi; and Mukai, Junji, 4,100,118, Cl. 260-18.0PT.
Okikawa, Susumu; and Mikino, Hiroshi, 4,100,566, Cl. 357-70.000.
Okumura, Masahide; Sakitani, Yoshio; Nakaisumi, Yasushi; and Nakata, Toshiaki, 4,099,704, Cl. 251-134.000.
Osakabe, Kuniharu, 4,099,848, Cl. 350-189.000.
Sasaki, Toshiyuki, 4,099,498, Cl. 123-117.00R.
Sasayama, Takao, 4,100,564, Cl. 357-46.000.
Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Konishi, Nobutake, 4,100,562, Cl. 357-19.000.
Sugie, Jiro, 4,100,463, Cl. 315-205.000.
Ueno, Yukichi; and Nakata, Toshiaki, 4,100,410, Cl. 250-311.000.

Ura, Mitsuru; Ogawa, Takuzo; Suzuki, Takaya; Inoue, Yosuke; and Nomura, Masayoshi, 4,100,310, Cl. 427-8.000.
Yamashiro, Osamu, 4,100,502, Cl. 330-264.000.
Hitachi Medical Corporation: *See*—
Kuroda, Masao; Kondo, Toshio; Ogawa, Toshio; and Ono, Sekijyuro, 4,099,419, Cl. 73-626.000.
Hitachi Plant Engineering and Construction Co., Ltd.: *See*—
Sahara, Tamotsu, 4,099,573, Cl. 169-37.000.
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having a touch vibrato effect. 4,099,438, Cl. 84-1.250.
Hobart Corporation: *See*—
Morphy, Paul H., 4,099,812, Cl. 312-214.000.
Shaeffer, Raymond P., 4,100,613, Cl. 366-143.000.
Thompson, James W., 4,100,615, Cl. 366-169.000.
Hobbs, Charles F.; and McMackins, Dudley E., to Monsanto Company. Production of unsaturated amines employing a palladium compound co-catalyzed with a phosphonite ligand. 4,100,194, Cl. 260-576.000.
Hobbs, Charles F.; and McMackins, Dudley E., to Monsanto Company. Production of N-(alkadienyl)amines. 4,100,196, Cl. 260-585.00D.
Hoch, Manfried L.: *See*—
Mackert, Robert J.; Storm, Donald P.; and Hoch, Manfried L., 4,099,368, Cl. 56-208.000.
Hockenberger, Lothar; Soyka, Manfred; and Wilhelm, Gerhard, to Rutgerswerke Aktiengesellschaft. Storage-stable, very quickly hardenable, one-component sealant based on mercapto-terminated polymers. 4,100,148, Cl. 528-374.000.
Hodakowski, Leonard Edward; and Osborn, Claiborn Lee, to Union Carbide Corporation. Radiation polymerizable cycloalkenyl derivatives of acrylated epoxidized fatty oils or fatty acids. 4,100,046, Cl. 204-159.230.
Hoebing, Robert J. Door security guard. 4,099,754, Cl. 292-206.000.
Hoechst Aktiengesellschaft: *See*—
Ehlers, Klaus-Peter; Lischka, Siegfried; and Burkhardt, Siegfried, 4,100,261, Cl. 423-309.000.
Kleber, Rolf; and Steckelberg, Willi, 4,100,078, Cl. 252-8.900.
Quietzsch, Gerhard; Greiner, Bernd; and Pelz, Lothar, 4,100,488, Cl. 324-127.000.
Schroter, Herbert; and Stein, Eckehard, 4,099,868, Cl. 355-106.000.
Waldmann, Karl; and Schnabel, Gunter, 4,100,340, Cl. 526-245.000.
Hoefke, Wolfgang: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Hoefke, Wolfgang; and Kohn, Franz Josef, 4,100,292, Cl. 424-273.00R.
Hoff, Marcian E., Jr., to Intel Corporation. MOS reference voltage circuit. 4,100,437, Cl. 307-297.000.
Hoffart, Ronald J. Track pad. 4,099,794, Cl. 305-13.000.
Hoffman, Gene D.: *See*—
Brown, George Emmett, Jr., 4,100,418, Cl. 250-510.000.
Hoffman, William: *See*—
Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Hoffman, William, 4,100,294, Cl. 424-275.000.
Hoffmann-La Roche Inc.: *See*—
Atherton, Frank Ratcliffe; Hall, Michael John; Hassall, Cedric Herbert; Ringrose, Peter Stuart; and Lambert, Robert Wilson, 4,100,275, Cl. 424-211.000.
Chan, Ka-Kong; and Saucy, Gabriel, 4,100,175, Cl. 260-345.500.
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,100,173, Cl. 260-333.000.
Stiel, Donald Melvyn; Browski, Charles Robert; Neugroschel, Eric; and Williams, Joseph James, 4,100,598, Cl. 364-476.000.
Westley, John; and Liu, Chao-Min, 4,100,171, Cl. 260-326.330.
Hollenbeck, Alfred L.; De Tuerk, Alison V.; and Cooper, John T., to Western Gear Corporation. Down hold packing gland and method for long stroke pumper. 4,099,571, Cl. 166-315.000.
Hollitscher, Herbert, to Canadian General Electric Co., Ltd. Permanent magnet latch for speed switching device. 4,100,382, Cl. 200-61.460.
Holloway, Donald Francis, to A. L. Gebhardt Company. Process for recovery and separation of nutritious protein hydrolysate and chromium from chrome leather scrap. 4,100,154, Cl. 260-123.700.
Hollyford Enterprises, Inc.: *See*—
Shinn, Robert C., Jr., 4,099,695, Cl. 248-351.000.
Holman, Bruce James, to International Business Machines Corporation. Error status reporting. 4,100,605, Cl. 364-900.000.
Holmes, C. Daniel: *See*—
Henkel, Charles E.; and Holmes, C. Daniel, 4,100,592, Cl. 362-191.000.
Holmstrom, Larry W.: *See*—
Fleming, Alan J.; and Holmstrom, Larry W., 4,100,597, Cl. 364-474.000.
Holter, Heinz. Extraction of charge gases from coke ovens. 4,100,033, Cl. 201-27.000.
Holtorf, Ehrhard T., to Ferrero GmbH. Display and transportation case for uniform packs. 4,099,613, Cl. 206-45.340.
Homeier, Edwin H.: *See*—
Schmerling, Louis; and Homeier, Edwin H., 4,100,359, Cl. 560-232.000.
Hommez, Etienne R. O. C.: *See*—
Carnewal, Jose A. C. L.; and Hommez, Etienne R. O. C., 4,099,942, Cl. 55-396.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Asaka, Urataro, 4,099,492, Cl. 123-32.0ST.
Nagase, Hidenobu; Kishida, Eiji; and Yoshihara, Mitsuji, 4,099,496, Cl. 123-41.310.
Nakano, Soichi; Ohama, Yasumichi; and Watanabe, Masao, 4,099,500, Cl. 123-122.0AB.
Okura, Takao; Hashimoto, Eiichi; and Ohama, Yasumichi, 4,099,502, Cl. 123-122.0AC.
Honeywell Inc.: *See*—
Pinckaers, B. Hubert, 4,099,906, Cl. 431-66.000.
Honig, Gunter: *See*—
Kiencke, Uwe; Flaig, Ulrich; Zechnall, Martin; and Honig, Gunter, 4,099,495, Cl. 123-32.0EB.
Hooker Chemicals & Plastics Corp.: *See*—
Cook, Edward H., Jr.; and Marks, Gerald R., 4,100,050, Cl. 204-252.000.
Schwartz, Willis T., Jr., 4,100,229, Cl. 260-887.000.
Hoopman, Abraham, to Hoopman Onderzoek & Ontwikkeling BV. Mixing and discharge apparatus. 4,100,617, Cl. 366-188.000.
Hoopman Onderzoek & Ontwikkeling BV: *See*—
Hoopman, Abraham, 4,100,617, Cl. 366-188.000.
Hoover Ball and Bearing Company: *See*—
Mizelle, Ned W., 4,099,775, Cl. 297-303.000.
Hoover, Richard D.; Shaeffer, Raymond P.; and Brackman, Donald A. Food processing apparatus. 4,100,612, Cl. 366-143.000.
Hopcroft, Francis J. Waste-water treatment system. 4,100,073, Cl. 210-532.00S.
Hoppe, Peter; Leyer, Helmut; and Muller, Johann, to Bayer Aktiengesellschaft. Hull, mold therefor, and process for producing same. 4,099,280, Cl. 9-6.00P.
Hori, Yasuro, to Hitachi, Ltd. Iron core for induction apparatuses. 4,100,521, Cl. 336-100.000.
Horikawa, Masayuki; Takata, Yataro; and Sumiyoshi, Kikuo, to Oiles Kogyo Kabushiki Kaisha. Method for manufacturing bearings or other anti-friction elements formed of lubricant contained polyacetal. 4,100,245, Cl. 264-211.000.
Horiuchi, Kaoru; Matsui, Akio; and Okamoto, Yoshio, to Kawasaki Jukogyo Kabushiki Kaisha. Composite material having wear- and impact-resisting surface and process for producing same. 4,099,988, Cl. 148-3.000.
Horn, Peter: *See*—
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,100,191, Cl. 260-557.00R.
Horwitz, Howard James, to Horwitz, Spencer G., a part interest. Swivel hook assembly. 4,099,694, Cl. 248-339.000.
Horwitz, Spencer G.: *See*—
Horwitz, Howard James, 4,099,694, Cl. 248-339.000.
Hota, Kazunori: *See*—
Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,099,934, Cl. 51-295.000.
Houdaille Industries, Inc.: *See*—
Mandt, Mikkel G., 4,100,614, Cl. 366-154.000.
Powell, John H.; and Callahan, James J., 4,099,597, Cl. 184-27.00B.
Hough, Harold L.: *See*—
Blaisdell, Ronald G.; and Hough, Harold L., 4,100,415, Cl. 250-455.000.
Houlihan, William J., to Sandoz, Inc. Imidazo [2,1-A]isoquinolines. 4,100,165, Cl. 260-288.0CF.
House, Bennie L. Blade-type holder for paper rolls. 4,099,681, Cl. 242-55.200.
House, Ralph, to Chevron Research Company. Polymerization of 2-pyrrolidone with catalyst prepared from the reaction product of CO_2 and anhydrous potassium pyrrolidonate. 4,100,145, Cl. 528-312.000.
Howell, William L. Parenteral fluid administration sets. 4,099,527, Cl. 128-214.00C.
Hubachek, Louis H. Light emitting walking cane. 4,099,535, Cl. 135-66.000.
Hubbard, James R., to Graphic Controls Corporation. Disposable marker. 4,100,549, Cl. 346-140.00A.
Hudler, Charles William; Swanson, Clare Eugene; Sundin, George Holger; and Niemi, Ilmer Isaac, to Conwed Corporation. Sorbent boom with flotation and apparatus and method for stuffing same. 4,099,619, Cl. 206-524.100.
Hudson, John Colin, to F.W. McConnel Limited. Harvesting of sugar cane. 4,099,365, Cl. 56-13.500.
Huff, Larry Dean, to RCA Corporation. Automatic disc wiping apparatus. 4,099,724, Cl. 274-47.000.
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, to Gates Rubber Company, The. Method of producing spirally wound electrochemical cells. 4,099,401, Cl. 72-147.000.
Hughes Aircraft Company: *See*—
Bilow, Norman; and Kimmel, Boyce G., 4,100,138, Cl. 526-262.000.
Ernstoff, Michael N., 4,100,579, Cl. 358-230.000.
Graube, Andrejs, 4,099,971, Cl. 96-27.00H.
Su, Stephen C., 4,099,317, Cl. 29-571.000.
Hughes, Austin: *See*—
Lawrenson, Peter John; and Hughes, Austin, 4,100,473, Cl. 318-696.000.
Hugin Kassaregister AB: *See*—
Lundstrom, Goran; and Huijsers, Willem, 4,100,402, Cl. 235-145.00R.
Huijsers, Willem: *See*—
Lundstrom, Goran; and Huijsers, Willem, 4,100,402, Cl. 235-145.00R.
Hultdin, Gustaf Matteus; and Hultdin, Ove Anders, to Hultdins Verkstads AB. Gripping device. 4,099,762, Cl. 294-88.000.
Hultdin, Ove Anders: *See*—
Hultdin, Gustaf Matteus; and Hultdin, Ove Anders, 4,099,762, Cl. 294-88.000.

Hultdins Verkstads AB: *See—*
Hultdin, Gustaf Matteus; and Hultdin, Ove Anders, 4,099,762, Cl. 294-88.000.
Humber, Leslie G.: *See—*
Demerson, Christopher A.; and Humber, Leslie G., 4,100,277, Cl. 424-244.000.
Humbert, Daniel: *See—*
Clemence, Francois; and Humbert, Daniel, 4,100,291, Cl. 424-267.000.
Humphreys, Charles B.: *See—*
Casowitz, Barry N.; Cowan, Michael D.; Humphreys, Charles B.; and Satya, Akella V. S., 4,100,486, Cl. 324-62.000.
Huni, Jean-Paul Robert: *See—*
Dewing, Ernest William; Huni, Jean-Paul Robert; Sood, Raman Radha; and Southam, Frederick William, 4,099,959, Cl. 75-10.00R.
Hunt, William Valentine; and Ducker, Frank Edward Mayhew, to Watkins & Watson Limited. Support appliances having articulated sections. 4,099,276, Cl. 5-72.000.
Hunter Investment Company: *See—*
Damon, Ralph S., 4,099,488, Cl. 122-156.000.
Hurletron Altair, Inc.: *See—*
Coberley, Daniel A.; and Hutchison, Joel F., 4,099,462, Cl. 101-153.000.
Husemann, Heinz; and Heitkamp, Herbert, to Gewerkschaft Eisenhutte Westfalia. Drive shield for tunneling apparatus and a method for operating such a shield. 4,099,388, Cl. 61-85.000.
Husky Industries Inc.: *See—*
Elberg, Anton J., 4,100,032, Cl. 201-27.000.
Hussey, Charles L.; Nardi, John C.; Fannin, Armand A., Jr.; King, Lowell A.; and Erbacher, John K., to United States of America, Air Force. Procedure for removing aluminum from an Al-Al_3Ni two-phase matrix. 4,100,044, Cl. 204-146.000.
Hutchins, James Peyton; Julian, Donald Victor; and Burns, Michael Eugene, to Procter & Gamble Company, The. Peroxyacid bleach composition having improved exotherm control. 4,100,095, Cl. 252-99.000.
Hutchison, Joel F.: *See—*
Coberley, Daniel A.; and Hutchison, Joel F., 4,099,462, Cl. 101-153.000.
Hutchison, Stanley O.; and Anderson, Glenn W., to Chevron Research Company. Steam injection system for use in a well. 4,099,563, Cl. 166-191.000.
Hutchison, Stanley O., to Chevron Research Company. Low heat conductive frangible centralizers. 4,099,564, Cl. 166-241.000.
Hyden, Hans Olof, to AB Centralsug. Method for discharging refuse. 4,099,457, Cl. 100-42.000.
Hydes, Paul Cedric; and Cleare, Michael James, to Johnson, Matthey & Co., Limited. Osmium compounds. 4,100,158, Cl. 544-225.000.
Hydra Corporation: *See—*
Bowley, Wallace W., 4,099,281, Cl. 9-8.00R.
Hydrocarbon Research, Inc.: *See—*
Johnson, Clarence A.; and Shen, John, 4,099,933, Cl. 48-202.000.
Wolk, Ronald H.; Rovesti, William; and Maruhnic, Peter, 4,100,107, Cl. 252-443.000.
Hypolite, Louis. Audio console system for home and vehicle. 4,100,372, Cl. 179-1.00G.
Ibsen, Ole N.: *See—*
Anderson, Thomas E.; Peak, Steven C.; and Ibsen, Ole N., 4,100,587, Cl. 361-82.000.
Ichikawa, Kiyoshi: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,099,438, Cl. 84-1.250.
Ichikawa, Kunihiro; Mie, Terumi; and Ona, Isao, to Toray Silicone Company, Ltd. Silicone binding compositions useful in preparing gaskets and packings. 4,100,124, Cl. 260-29.20M.
Ichikawa, Yataro; Suzuki, Nobuo; and Sawaki, Toru, to Teijin, Limited. Process for hydrogenating unsaturated aldehydes to unsaturated alcohols. 4,100,180, Cl. 260-347.800.
ICI Americas Inc.: *See—*
Rutledge, Thomas F., 4,100,202, Cl. 568-730.000.
Rutledge, Thomas F., 4,100,203, Cl. 568-730.000.
Rutledge, Thomas F., 4,100,204, Cl. 568-730.000.
Rutledge, Thomas F., 4,100,205, Cl. 568-730.000.
Rutledge, Thomas F., 4,100,206, Cl. 568-730.000.
Ideal-Aerosmith, Inc.: *See—*
Lush, William, 4,099,703, Cl. 251-122.000.
Iijima, Yaichi, to Konishiroku Photo Industry Co., Ltd. Camera. 4,100,554, Cl. 354-145.000.
Iio, Toshimitsu, to Yamaha Hatsudoki Kabushiki Kaisha. Anti-skid vehicle brake system with fluid pressure actuated regulating valve. 4,099,793, Cl. 303-116.000.
Ikawa, Katsuya; and Tanaka, Yuichi, to Riken Piston Ring Industrial Co. Ltd. High duty ductile case iron and its heat treatment method. 4,099,994, Cl. 148-35.000.
Ikoma, Hidenobu: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,100,299, Cl. 424-330.000.
Illinois Tool Works Inc.: *See—*
Klygis, Julius Mindaugas, 4,099,616, Cl. 206-427.000.
Ilse, Walter: *See—*
Wohler, Hans-Joachim; and Ilse, Walter, 4,099,675, Cl. 239-498.000.
Imai, Tomoyasu: *See—*
Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,099,934, Cl. 51-295.000.
Imai, Toshihiro, to Olympus Optical Co., Ltd. Compact large-aperture photographic lens system with long back focal length. 4,099,843, Cl. 350-176.000.
Imamura, Makoto: *See—*
Ohte, Akira; and Imamura, Makoto, 4,099,413, Cl. 73-359.00R.
Immordino, Vincent J., to Display Originals, Inc. Convertible blister-card package. 4,099,650, Cl. 221-266.000.
Imperial Chemical Industries Limited: *See—*
Cross, Graham Westwood; and Reid, Thomas James, 4,099,464, Cl. 102-24.0HC.
Dutta, Anand Swaroop; Furr, Barrington John Albert; and Giles, Michael Brian, 4,100,274, Cl. 424-177.000.
Wright, Donald, 4,100,186, Cl. 260-465.80D.
In Situ Technology, Inc.: *See—*
Terry, Ruel Carlton, 4,099,567, Cl. 166-261.000.
Inbar, Dan; and Klein, Yitzhak, to Elscint Ltd. Radiation imaging apparatus with improved accuracy. 4,100,413, Cl. 250-366.000.
Incom International Inc.: *See—*
Papp, Louis S., 4,099,540, Cl. 137-493.800.
Indra, Jaromir, to Vysoke uceni technicke. Fuel injection for diesel engines having controlled-rate pressure relief means. 4,099,894, Cl. 417-499.000.
Industrie Pirelli S.p.A.: *See—*
Cicognani, Mario; and Mirabelli, Bruno, 4,099,422, Cl. 74-231.00C.
Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft: *See—*
Miller, Harry B., 4,099,680, Cl. 242-18.00A.
Ingham, John D.: *See—*
United States of America, National Aeronautics and Space Administration; Ingham, John D.; and Lawson, Daniel D., 4,100,331, Cl. 429-13.000.
Inglee, Clinton F., to United States of America, Navy. Exhaust plume reduction and cooling system. 4,099,375, Cl. 60-39.500.
Inoue, Hiroo; and Kishimoto, Isao, to Nippon Air Brake Co., Ltd., The. Remote control apparatus for marine engines. 4,099,476, Cl. 114-144.00R.
Inoue, Yosuke: *See—*
Ura, Mitsuru; Ogawa, Takuzo; Suzuki, Takaya; Inoue, Yosuke; and Nomura, Masayoshi, 4,100,310, Cl. 427-8.000.
Institut Cerac SA.: *See—*
Cooper, George A., 4,099,784, Cl. 299-10.000.
Instrumentation Specialties Company: *See—*
Allington, Robert William, 4,099,921, Cl. 23-253.00R.
Instrumentation Technology Corp.: *See—*
Moya, Ephraim F., 4,099,686, Cl. 242-198.000.
Intel Corporation: *See—*
Hoff, Marcian E., Jr., 4,100,437, Cl. 307-297.000.
Intercontinental Truck Body - Montana, Inc.: *See—*
Compaan, Pieter, 4,099,358, Cl. 52-588.000.
International Business Machines Corporation: *See—*
Caricchio, Jerome Joseph, Jr.; and York, Edward Robert, 4,100,039, Cl. 204-43.00N.
Casowitz, Barry N.; Cowan, Michael D.; Humphreys, Charles B.; and Satya, Akella V. S., 4,100,486, Cl. 324-62.000.
Eggenberger, John Scott; and Patel, Arvind Motibhai, 4,100,403, Cl. 235-312.000.
Fleming, Alan J.; and Holmstrom, Larry W., 4,100,597, Cl. 364-474.000.
Holman, Bruce James, 4,100,605, Cl. 364-900.000.
Jambotkar, Chakrapani Gajanan, 4,099,987, Cl. 148-1.500.
Jones, Rick Owen; and Ulrich, Michael Henry, 4,099,866, Cl. 355-58.000.
Monrolin, Jean Louis, 4,100,499, Cl. 329-50.000.
Tsui, Frank; and Tsui, Katherine, 4,100,447, Cl. 313-217.000.
International Harvester Company: *See—*
Mackert, Robert J.; Storm, Donald P.; and Hoch, Manfried L., 4,099,368, Cl. 56-208.000.
Iowa State University Research Foundation, Inc.: *See—*
Glock, Robert D.; Harris, Delbert L.; and Schwartz, Kent J., 4,100,272, Cl. 424-92.000.
Ireland, Richard D.: *See—*
Dick, Charles B.; Knutson, Curtis L.; Jones, Frederick W.; and Ireland, Richard D., 4,099,661, Cl. 228-107.000.
Irons, Henry R.: *See—*
Schwee, Leonard J.; Irons, Henry R.; Anderson, Wallace F.; Scharnhorst, Kurt Peter; and Krall, Albert D., 4,100,609, Cl. 365-87.000.
Ishibashi, Isao: *See—*
Somezawa, Masashi; Higuchi, Shigetaka; Shimizu, Tatsuo; and Ishibashi, Isao, 4,100,326, Cl. 427-130.000.
Ishihara, Yutaka: *See—*
Sunahara, Hiroshi; Ishihara, Yutaka; Tanaka, Kazuhiko; and Morimoto, Yuko, 4,099,871, Cl. 356-73.000.
Ishikawa, Soji. Cleaners for chalk erasers. 4,099,286, Cl. 15-142.000.
Isii, Sigeki: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,099,438, Cl. 84-1.250.
Isodyne, Inc.: *See—*
Ghiringhelli, Horace, 4,100,476, Cl. 315-297.000.
Isono, Nobujiro, to Shin Nippon Kinzoku Co., Ltd. Adjustably louvered roof plate assembly. 4,099,346, Cl. 49-82.000.
Itakura, Tsuyoshi; and Willinger, Allan H. Vent valve of an air pump. 4,099,544, Cl. 137-856.000.
Itek Corporation: *See—*
Ebner, Peter R., 4,099,618, Cl. 206-454.000.

Ito, Tadashi: *See—*
Nakamura, Zenzo; Ohtaki, Syohei; Tsunekawa, Tokuichi; Ito, Tadashi; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,100,459, Cl. 315-136.000.
Ito, Yoshikane. Fruit plucking device. 4,099,367, Cl. 56-336.000.
Ito, Yukio, to Nitto Kogaku Kabushiki Kaisha. Zoom lens system capable of close-up photography. 4,099,847, Cl. 350-187.000.
ITW Limited: *See—*
Palmer, John P.; Clinch, Colin W.F.; and Harley, David N., 4,099,757, Cl. 292-336.300.
Ivanova, Nadezhda Borisovna: *See—*
Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Schedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich, 4,099,334, Cl. 33-346.000.
Ivchenko, Anatoly Ivanovich: *See—*
Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; Zvenyachkin, Viktor Matveevich; Ivchenko, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; and Fedorov, Evgeny Petrovich, 4,099,572, Cl. 169-12.000.
Iwamoto, Kyoichi; and Kakei, Hiroshi, to Tokuyama Sekisui Kogyo Kabushiki Kaisha. Agent for improving weatherability of synthetic resin. 4,100,222, Cl. 260-837.0PV.
Iyotani, Ryuji; Watanabe, Atsumi; Amano, Hisao; and Ogata, Fumio, to Hitachi, Ltd. Gate controlling apparatus for a thyristor valve. 4,100,434, Cl. 307-252.00L.
Jabour, Richard J. Slip-on rubber gloves. 4,099,270, Cl. 2-168.000.
Jackson, George Robert, to Arcstart, Inc. Control means for tig type torches and the like. 4,100,390, Cl. 219-74.000.
Jackson, Samuel H., to Kings Electronics Co., Inc. Coaxial adapter. 4,099,825, Cl. 339-177.00E.
Jacobs Corporation, The: *See—*
Jacobs, David L., 4,099,769, Cl. 297-204.000.
Jacobs, David L., to Jacobs Corporation, The. Apparatus for adjusting tension in a bicycle saddle. 4,099,769, Cl. 297-204.000.
Jacobson, Sven Eric: *See—*
Sander, Georg; Jacobson, Sven Eric; and Ericson, Ake Magnus Ivar, 4,099,471, Cl. 110-182.500.
Jacovich, Elaine F.: *See—*
Lombardo, Michael S.; Jacovich, Elaine F.; D'Ottavio, Eugene D.; and Grunwald, John J., 4,100,312, Cl. 427-96.000.
Jaedicke, Hagen; Paust, Joachim; and Schneider, Joachim, to BASF Aktiengesellschaft. Manufacture of echinenone. 4,100,197, Cl. 260-586.00P.
Jager, Adolf: *See—*
Gutlhuber, Friedrich; Jager, Adolf; and Ufholz, Heinrich, 4,099,926, Cl. 23-286.000.
Jambor, Arno: *See—*
Schmid, Walter; Jambor, Arno; Wilfert, Karl, deceased; and Wilfert, Thomas, heir, 4,099,792, Cl. 303-113.000.
Jambotkar, Chakrapani Gajanan, to International Business Machines Corporation. Fabricating integrated circuits incorporating high-performance bipolar transistors. 4,099,987, Cl. 148-1.500.
Jannen, Robert L.: *See—*
Johnston, Douglas; and Jannen, Robert L., 4,100,610, Cl. 366-102.000.
Japan Steel Works LTD: *See—*
Nonaka, Hidehiro, 4,100,244, Cl. 264-211.000.
Japs, Archie B., to BF Goodrich Company, The. Gas generator and solid propellant with a silicon-oxygen compound as a burning rate modifier, and method for making the same. 4,099,376, Cl. 60-253.000.
Jayant, Nuggehally Sampath; and Kak, Subhash Chandra, to Bell Telephone Laboratories, Incorporated. Uniform permutation privacy system. 4,100,374, Cl. 179-1.50S.
Jayne, Murray Lawrence. Runway sander. 4,099,688, Cl. 244-103.00R.
Jean, Pierre: *See—*
Guilhem, Jacques R.; and Jean, Pierre, 4,099,649, Cl. 220-439.000.
Jenaer Glaswerk Schott & Gen.: *See—*
Faulstich, Marga; Neuroth, Norbert; Reitmayer, Franz; and Krolla, Georg, 4,099,834, Cl. 350-96.340.
Jersey Nuclear-AVCO Isotopes, Inc.: *See—*
Glickler, Sheldon L.; and DeBaryshe, Paul G., 4,099,853, Cl. 350-310.000.
Jezl, James L.; and Peters, Edwin F., to Standard Oil Company (Indiana). Drying and finishing operations in slurry or bulk phase polymerization processes. 4,099,335, Cl. 34-9.000.
Jilani, Atiq A., to Borg-Warner Corporation. High-speed agricultural disc. 4,099,576, Cl. 172-555.000.
Jinno, Michio. Asphalt recycle system. 4,100,059, Cl. 209-3.000.
Johannes Fuchs, Firma: *See—*
Thierer, Georg; and Dolinsek, Hans, 4,099,631, Cl. 214-10.000.
Johansson, Arne: *See—*
Sterner, Thore; and Johansson, Arne, 4,099,676, Cl. 239-687.000.
Sterner, Thore; and Johansson, Arne, 4,099,689, Cl. 244-136.000.
John Blue Company Division of Subscription Television, Inc.: *See—*
Johnston, Douglas; and Jannen, Robert L., 4,100,610, Cl. 366-102.000.
John Dusenbery Company, Inc.: *See—*
Young, Roger W., 4,099,435, Cl. 83-614.000.
Johns Hopkins University, The: *See—*
Walser, Mackenzie, 4,100,160, Cl. 424-274.000.
Walser, Mackenzie, 4,100,161, Cl. 424-274.000.
Walser, Mackenzie, 4,100,293, Cl. 424-274.000.
Johns-Manville Corporation: *See—*
Meserole, Robert Henry, 4,099,747, Cl. 285-174.000.
Olds, Leonard Elmo, 4,099,949, Cl. 65-17.000.
Johnson, Barry C.: *See—*
Pops, Horace; and Johnson, Barry C., 4,099,991, Cl. 148-11.50C.
Johnson, Bruce K., to Polaroid Corporation. Modular photographic rangefinder camera. 4,100,555, Cl. 354-166.000.
Johnson, Clarence A.; and Shen, John, to Hydrocarbon Research, Inc. Process for the multiple zone gasification of coal. 4,099,933, Cl. 48-202.000.
Johnson, David Leroy; and Matusek, Chester Joseph, to Motorola, Inc. Mechanism for feeding and inserting pins into circuit board. 4,099,324, Cl. 29-739.000.
Johnson, George E.: *See—*
Rodesch, Dale F.; and Johnson, George E., 4,099,722, Cl. 273-143.00R.
Johnson, Matthey & Co., Limited: *See—*
Hydes, Paul Cedric; and Cleare, Michael James, 4,100,158, Cl. 544-225.000.
Johnson, Michael Robert Thomas: *See—*
Gallant, John Henry; and Johnson, Michael Robert Thomas, 4,100,542, Cl. 340-518.000.
Johnson, Philip M.; and Kuppenheimer, John D., Jr., to Sanders Associates, Inc. Beam projector. 4,100,404, Cl. 250-199.000.
Johnston, Douglas; and Jannen, Robert L., to John Blue Company Division of Subscription Television, Inc. Rotating nozzle sparging system for suspension fertilizer tanks. 4,100,610, Cl. 366-102.000.
Jones, Frederick W.: *See—*
Dick, Charles B.; Knutson, Curtis L.; Jones, Frederick W.; and Ireland, Richard D., 4,099,661, Cl. 228-107.000.
Jones, John P., Jr., to Mobil Oil Corporation. Ullage gage. 4,099,332, Cl. 33-126.70R.
Jones, Rick Owen; and Ulrich, Michael Henry, to International Business Machines Corporation. Focal adjustment on a single-focus lens in a continuously variable magnification system. 4,099,866, Cl. 355-58.000.
Jongkind, Jan C., to M&T Chemicals Inc. Plating on aluminum alloys. 4,100,038, Cl. 204-38.00B.
Joo, Laszlo. Bicycle cable locking device. 4,099,394, Cl. 70-233.000.
Jordan, Cy Edward; and Weaver, Casimir Paul, to United States of America, Interior. System for the dielectrophoretic separation of particulate and granular material. 4,100,068, Cl. 204-300.00R.
Josephy, Karl: *See—*
Gordon, Gerald A.; and Josephy, Karl, 4,100,236, Cl. 264-8.000.
Jueckstock, Dale Allen; and Hindman, Thomas Wayne, Sr., to McKellar, Robert L., a part interest. Device for centering and maintaining short spool pieces. 4,099,283, Cl. 10-107.0PH.
Jugle, Don B., to Xerox Corporation. Apparatus for controlling airborne particle emission. 4,100,611, Cl. 366-139.000.
Julian, Donald Victor: *See—*
Hutchins, James Peyton; Julian, Donald Victor; and Burns, Michael Eugene, 4,100,095, Cl. 252-99.000.
Jung, Michel: *See—*
Metcalf, Brian Walter; and Jung, Michel, 4,100,349, Cl. 548-337.000.
K. K. Tokai Rika Denki Seisakusho: *See—*
Mori, Mamoru; Yasumatsu, Jun; and Kubota, Tatsushi, 4,099,684, Cl. 242-107.000.
Kabelschlepp Gesellschaft mit beschrankter Haftung: *See—*
Steinmetz, Dietmar, 4,099,798, Cl. 308-3.500.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Orimoto, Koji; Uno, Masataka; Oomachi, Yoshio; and Nishimura, Yoshitaka, 4,099,449, Cl. 91-358.00A.
Kabushiki Kaisha Kubota Seisakusho: *See—*
Uchida, Tadahiro, 4,099,667, Cl. 233-24.000.
Kabushiki-Kaisha Nakajima: *See—*
Nakajima, Hiromu, 4,099,662, Cl. 228-151.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Kuwako, Tomohisa, 4,100,443, Cl. 310-164.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Hasegawa, Junzo; Hayashi, Yasutaka; Suzuki, Yasuhiko; Katoh, Takashi; Tsunekawa, Takahiko; and Tanaka, Akira, 4,099,297, Cl. 19-240.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Hasegawa, Junzo; Hayashi, Yasutaka; Suzuki, Yasuhiko; Katoh, Takashi; Tsunekawa, Takahiko; and Tanaka, Akira, 4,099,297, Cl. 19-240.000.
Kagami, Akiyasu: *See—*
Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,100,454, Cl. 313-495.000.
Kagoura, Tetsuro, to Yoshida Kogyo K.K. Latch assembly. 4,099,756, Cl. 292-336.300.
Kaiser Aluminum & Chemical Corporation: *See—*
Dorsey, Geoffrey A., Jr., 4,099,989, Cl. 148-6.270.
Kak, Subhash Chandra: *See—*
Jayant, Nuggehally Sampath; and Kak, Subhash Chandra, 4,100,374, Cl. 179-1.50S.
Kakei, Hiroshi: *See—*
Iwamoto, Kyoichi; and Kakei, Hiroshi, 4,100,222, Cl. 260-837.0PV.
Kalfoglou, George; and Flournoy, Kenoth H., to Texaco Inc. Method for transportation of viscous hydrocarbons by pipeline. 4,099,537, Cl. 137-13.000.
Kalman, Kenneth S.: *See—*
Sterling, Thomas S.; Belanger, Jean-Yves; and Kalman, Kenneth S., 4,100,000, Cl. 149-4.000.

Kamata, Norio: *See—*
Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sakado, 4,100,025, Cl. 195-31.00F.

Kambara, Masahiro: *See—*
Morio, Minoru; and Kambara, Masahiro, 4,100,575, Cl. 358-120.000.

Kamerbeek, Djuurd Anne Geertruid: *See—*
van den Einden, Henricus Fransiscus Petrus; Kamerbeek, Djuurd Anne Geertruid; and Rimmelzwaan, Franciscus Jacobus, 4,100,453, Cl. 313-417.000.

Kamm, Roland: *See—*
Knappe, Bernhard, 4,099,803, Cl. 308-215.000.

Kamyr, Inc.: *See—*
Sherman, Michael I., 4,100,069, Cl. 210-109.000.

Kanamaru, Kiyoshi: *See—*
Abe, Nobuyoshi; Kubo, Shigenaga; and Kanamaru, Kiyoshi, 4,100,074, Cl. 252-8.100.

Kaneko, Masanobu, to Nippon Kogaku K.K. Wide field eyepiece lens system. 4,099,842, Cl. 350-175.00E.

Kanengieter, Glenn G.; and Krumholz, Frank C., to Owatonna Manufacturing Company, Inc. Fluffer shield system for crop harvester. 4,099,364, Cl. 56-1.000.

Kania, Siegmund; Zweigart, Gerhard; Luz, Karl; and Lutz, Edgar, to Daimler-Benz Aktiengesellschaft. Fastening of the inner roof covering of motor vehicles. 4,099,767, Cl. 296-137.00A.

Kannengiesser, Marie-Helene: *See—*
Nedelec, Lucien; Frechet, Daniel; Dumont, Claude; and Kannengiesser, Marie-Helene, 4,100,278, Cl. 424-244.000.

Kanner, Bernard: *See—*
Mui, Jeffrey Y. P.; and Kanner, Bernard, 4,100,172, Cl. 260-327.00H.

Kanno, Sakado: *See—*
Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sakado, 4,100,025, Cl. 195-31.00F.

Kano, Tsutomu. Method and an apparatus for stereoscopic measurement utilizing a three-dimensional image. 4,099,880, Cl. 356-164.000.

Kao, James T. F., to Ethyl Corporation. Chemical process. 4,100,188, Cl. 260-535.00P.

Kao Soap Co., Ltd.: *See—*
Fukusaki, Hiroshi; Niki, Masao; and Yokota, Yukinaga, 4,100,127, Cl. 260-29.6NR.

Kapag Manufacturing Co. Limited: *See—*
Loads, Frederic Walter, 4,099,345, Cl. 47-56.000.

Kaplan, Jean-Pierre: *See—*
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,100,173, Cl. 260-333.000.

Kaplan, Murray A.: *See—*
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 4,100,346, Cl. 544-27.000.

Kaplan, Sam H., to Zenith Radio Corporation. Color television picture tube image screen having positive and negative misregistration tolerance conditions. 4,100,452, Cl. 313-408.000.

Kaplan, Steven. Coffee-maker assembly. 4,099,453, Cl. 99-306.000.

Karasinski, Frederick: *See—*
Senior, Robert B.; and Karasinski, Frederick, 4,099,428, Cl. 81-9.510.

Kark, Uwe. Composite roll with roll ring of material which is sensitive to tensile stress. 4,099,311, Cl. 29-126.000.

Karl Harlin & Co.: *See—*
Harlin, Herbert, 4,099,446, Cl. 90-13.100.

Karol, Frederick John: *See—*
Levine, Isaac Jacob; and Karol, Frederick John, 4,100,105, Cl. 252-429.00R.
Noshay, Allen; and Karol, Frederick John, 4,100,337, Cl. 526-130.000.

Karrer, Friedrich: *See—*
Farooq, Saleem; and Karrer, Friedrich, 4,100,296, Cl. 424-278.000.

Kato, Shigeo; Saito, Sakae; and Morita, Osamu, to Hitachi, Ltd. Machining arrangement with means to isolate vibrations from the working spindle. 4,099,348, Cl. 51-92.00R.

Katoh, Takashi: *See—*
Hasegawa, Junzo; Hayashi, Yasutaka; Suzuki, Yasuhiko; Katoh, Takashi; Tsunekawa, Takahiko; and Tanaka, Akira, 4,099,297, Cl. 19-240.000.

Katzen, Stanley J.; and Rekers, Louis J., to National Petro Chemicals Corporation. Catalytic materials as for olefin polymerization. 4,100,104, Cl. 252-428.000.

Kaufman, Paul Richard: *See—*
Goldberg, Gerald; and Kaufman, Paul Richard, 4,100,126, Cl. 260-29.6AQ.

Kaufman, Phillip A.; and Washburn, Jerry R., to Computer Automation, Inc. Multiplexer for a distributed input/out controller system. 4,100,601, Cl. 364-200.000.

Kaufmann, Peter, to Mettler Instrumente, AG. Electromagnetic compensation weighing apparatus including preloading and load-responsive current components. 4,099,587, Cl. 177-210.0EM.

Kavick, Edward M., to Samuel Moore and Company. Hose coupling assembly. 4,099,748, Cl. 285-256.000.

Kawamoto, Mineo: *See—*
Morishita, Hirosada; Kawamoto, Mineo; Wajima, Motoyo; and Murakami, Kanji, 4,099,974, Cl. 106-1.230.

Kawamura, Naoto; Tajima, Akira; and Tanaka, Katumi, to Canon Kabushiki Kaisha. Variable magnification lens system. 4,099,846, Cl. 350-186.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Horiuchi, Kaoru; Matsui, Akio; and Okamoto, Yoshio, 4,099,988, Cl. 148-3.000.

Kawasaki, Masahiro; and Tano, Eiichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Digital display circuit for camera exposure meter. 4,099,885, Cl. 356-223.000.

Kaye, Ronald Swynerton. Carburetors. 4,100,232, Cl. 261-36.00A.

Kazama, Seiji: *See—*
Tatsumi, Tetsujiro; Miyamoto, Reiji; Narasaki, Shiro; Kazama, Seiji; and Tanaka, Michio, 4,099,638, Cl. 215-12.00R.

Keana, John F. W., to State Board of Higher Education For and on Behalf of the University of Oregon. Proxyl nitroxides as spin labels. 4,099,918, Cl. 23-230.00R.

Keeran, Royal V., to General Dynamics Corporation. Beacon system employing ramped gain receiver. 4,100,544, Cl. 343-6.50R.

Keglewitsch, Josef, to Bunker Ramo Corporation. Modular termination system for telecommunication devices. 4,099,819, Cl. 339-75.00M.

Keir, John B.: *See—*
Binkley, Carl R.; Keir, John B.; and Semchena, John H., 4,099,541, Cl. 137-596.130.

Keller, Rolf; and Polzer, Erich, to Voith Getriebe KG. Hydrodynamic transmission for vehicles. 4,099,426, Cl. 74-730.000.

Kellogg, Harlan F. Free standing shelving system. 4,099,472, Cl. 108-114.000.

Kelly, Robert C., to Upjohn Company, The. 4,5-Didehydro-6-hydroxy-2β-arylmethoxymethyl-4α-tetrahydropyranacetic acids. 4,100,176, Cl. 260-345.70P.

Kelly, Robert C., to Upjohn Company, The. 4,5-Didehydro-6-hydroxy-2-arylmethoxymethyl-4α-tetrahydropyranacetic acid alkyl esters. 4,100,177, Cl. 260-345.80P.

Kelly, Robert C., to Upjohn Company, The. 4,5-Didehydro-6-methoxy-2-arylmethoxymethyl-4α-tetrahydropyranacetic acid alkyl esters. 4,100,178, Cl. 260-345.80P.

Kendall, Robert M.; and Lapson, William F., to Acurex Corporation. Rejector drive system for sorting apparatus. 4,099,620, Cl. 209-74.00R.

Kennecke, Mario: *See—*
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,026, Cl. 195-51.00G.
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,027, Cl. 195-51.00G.

Kenney, John Thomas: *See—*
Baron, William James; and Kenney, John Thomas, 4,100,037, Cl. 204-15.000.

Kent, Eric George, to Polysar Limited. Trans-polyisoprene compositions. 4,100,122, Cl. 260-28.50B.

Kepes, George B.: *See—*
Woytiuk, Leo Victor; Mayer, Ronald Yves; and Kepes, George B., 4,100,002, Cl. 156-48.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Besocke, Karl Heinz, 4,100,442, Cl. 310-317.000.

Kerr, William J., to Chicago Lock Co. Pick-resistant axial split-pin tumbler-type lock mechanism. 4,099,396, Cl. 70-363.000.

Keske, Frank E.: *See—*
Goloff, Alexander; and Keske, Frank E., 4,099,494, Cl. 123-32.0JV.

Kesler, Oren Byrl: *See—*
Hemmi, Christian Otto; Kesler, Oren Byrl; and Dover, Richard Thomas, 4,100,548, Cl. 343-837.000.

Keuffel & Esser Company: *See—*
Neithardt, William A., Jr., 4,100,329, Cl. 428-413.000.

Keystone Consolidated Industries, Inc.: *See—*
Dauenbaugh, Robert L., 4,099,397, Cl. 70-371.000.

Khajezadeh, Heshmat; and Ahrens, Stephen Carl, to RCA Corporation. Monolithic resistor for compensating beta of a lateral transistor. 4,100,565, Cl. 357-51.000.

Kiencke, Uwe; Flaig, Ulrich; Zechnall, Martin; and Honig, Gunter, to Robert Bosch GmbH. Method and apparatus to determine the timing of a periodically repetitive event with respect to the position of a rotating body, and more particularly ignition timing, fuel injection timing, and the like, in automotive internal combustion engines. 4,099,495, Cl. 123-32.0EB.

Kieronski, John P.; Williams, Francis N.; and Smith, Leo J., to Whitin Machine Works, Inc. Bobbin elevating conveyor and orientor. 4,099,609, Cl. 198-395.000.

Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, to Mitsubishi Chemical Iadustries Limited. Pharmaceutically active 2-omega-aminoalkoxydiphenylmethylmethanes. 4,100,299, Cl. 424-330.000.

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Kim, Young Ran, to Technicon Instruments Corporation. Process for preparing a cell suspension from blood for discrimination of white blood cells and platelets from other blood particles. 4,099,917, Cl. 23-230.00B.

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Anderson, Richard A.; Sokolowski, Robert C.; and Ostermeier, Kurt W., 4,100,324, Cl. 428-288.000.
Schwartz, Robert J., 4,100,319, Cl. 428-171.000.

Kimmel, Boyce G.: *See*—
Bilow, Norman; and Kimmel, Boyce G., 4,100,138, Cl. 526-262.000.

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Hussey, Charles L.; Nardi, John C.; Fannin, Armand A., Jr.; King, Lowell A.; and Erbacher, John K., 4,100,044, Cl. 204-146.000.

King, Olin B., to SCI Systems, Inc. Rotary electrical printer and method. 4,100,551, Cl. 346-162.000.

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Kings Electronics Co., Inc.: *See*—
Jackson, Samuel H., 4,099,825, Cl. 339-177.00E.

Kirilloff, Victor V.; and Benson, William A., to Mosebach Manufacturing Company. Grid resistor. 4,100,526, Cl. 338-279.000.

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Kuhn-Kuhnenfeld, Franz; Kirsten, Dietmar; and Maier, Marianne, 4,100,014, Cl. 156-647.000.

Kishida, Eiji: *See*—
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Inoue, Hiroo; and Kishimoto, Isao, 4,099,476, Cl. 114-144.00R.

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Kleber, Rolf; and Steckelberg, Willi, to Hoechst Aktiengesellschaft. Secondary etheramine acetates and their use as lubricating agents for synthetic fibers. 4,100,078, Cl. 252-8.900.

Klein, Yitzhak: *See*—
Inbar, Dan; and Klein, Yitzhak, 4,100,413, Cl. 250-366.000.

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Wahren, Douglas; Stenberg, Erik Gunnar; and Klerelid, Berndt Erik Ingvar, 4,100,018, Cl. 162-203.000.

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Summers, James William; and Kliner, George Joseph, 4,100,325, Cl. 428-334.000.

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Nelson, Terrance D.; and Klippel, Bruce G., 4,100,469, Cl. 318-227.000.

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Klygis, Julius Mindaugas, to Illinois Tool Works Inc. Two-bottle package and bag. 4,099,616, Cl. 206-427.000.

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Kneifel, Jerome J.; and Veburg, John C., to Dale Electronics, Inc. Electrical resistor testing fixture and testing chamber. 4,100,489, Cl. 324-158.00F.

Knepler, John T., to Dickey-john Corporation. Seed level sensor for automatic seed planting apparatus. 4,100,538, Cl. 340-617.000.

Knippenberg, Gerald V. Method and apparatus for making color separations from a color transparency. 4,099,865, Cl. 335-37.000.

Knutson, Curtis L.: *See*—
Dick, Charles B.; Knutson, Curtis L.; Jones, Frederick W.; and Ireland, Richard D., 4,099,661, Cl. 228-107.000.

Koa Oil Co., Ltd.: *See*—
Yoshimura, Kiyoharu; and Hayashi, Masao, 4,100,265, Cl. 423-449.000.

Kobashi, Mamoru: *See*—
Noguchi, Yoshikazu; Senda, Katsuyuki; and Kobashi, Mamoru, 4,099,508, Cl. 123-148.0DC.

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United States of America, National Aeronautics and Space Administration; Kobayashi, Herbert S.; Fowler, Joe; and Kurple, William, 4,100,531, Cl. 340-146.10E.

Kobayashi, Ryuichiro: *See*—
Sato, Yuzuru; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenji; and Oya, Tadanori, 4,099,972, Cl. 96-29.00D.

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Narui, Hiroshi; Akune, Ikuo; and Kobiki, Yosiya, 4,100,317, Cl. 428-137.000.

Kocher, Clemens: *See*—
Kuhne, Manfred; Kocher, Clemens; and Gallay, Jean Jacques, 4,100,283, Cl. 424-248.500.

Koel, Gerrit J.; Gorter, Frederik W.; and Gerkema, Jan T., to U.S. Philips Corporation. Thin-film magnetic head for reading and writing information. 4,100,583, Cl. 360-113.000.

Koernig, Wolfgang: *See*—
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,100,191, Cl. 260-557.00R.

Kohn, Franz Josef: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Hoefke, Wolfgang; and Kohn, Franz Josef, 4,100,292, Cl. 424-273.00R.

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Koizumi, Hideaki: *See*—
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Kolb, Ulrich, to Daimler-Benz Aktiengesellschaft. Idling abutment for the governor of an injection pump of an air-compressing internal combustion engine. 4,099,506, Cl. 123-140.00J.

Kolkman, Dick J., to Westinghouse Air Brake Company. Transfer apparatus for energy sources. 4,099,692, Cl. 246-34.0CT.

Kollberg, Sten, to ASEA Aktiebolag. DC Electric arc furnace melt connection. 4,100,364, Cl. 13-9.00R.

Koller, Stefan; Reinker, Dieter; and Schwander, Hans Rudolf, to Ciba-Geigy AG. Method of dyeing with dispersible azo anilino dyestuffs. 4,099,909, Cl. 8-41.00C.

Kolyshenko, Mikhail Vasilievich: *See*—
Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; Zvenyachkin, Viktor Matveevich; Ivchenko, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; and Fedorov, Evgeny Petrovich, 4,099,572, Cl. 169-12.000.

Komuro, Katsu, to Hitachi, Ltd. Phase control apparatus. 4,100,435, Cl. 307-262.000.

Kondo, Kiyoshi; Tunemoto, Daiei; Sugimoto, Kikuo; and Takahatake, Yuriko, to Sagami Chemical Research Center. Process for producing 3-cyanomethyl cyclopentanone derivatives. 4,100,184, Cl. 260-464.000.

Kondo Manufacturing Co., Ltd.: *See*—
Mase, Yoji, 4,099,450, Cl. 91-403.000.

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Kuroda, Masao; Kondo, Toshio; Ogawa, Toshio; and Ono, Sekijyuro, 4,099,419, Cl. 73-626.000.

Kondrollochis, Michael. Photo-electric scanner for line following devices. 4,100,405, Cl. 250-202.000.

Konig, Joachim; Suling, Carlhans; and Boehmke, Gunther, to Bayer Aktiengesellschaft. Process for preparing acrylonitrile/vinyl chloride copolymers having an increased viscosity which comprises using anionic/non-ionic emulsifier blends. 4,100,339, Cl. 526-193.000.

Konishi, Nobutake: *See*—
Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Konishi, Nobutake, 4,100,562, Cl. 357-19.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Iijima, Yaichi, 4,100,554, Cl. 354-145.000.
Sato, Yuzuru; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenji; and Oya, Tadanori, 4,099,972, Cl. 96-29.00D.

Kontsch, Otmar; and Schmidt, Fritz, to Siemens Aktiengesellschaft. Equalizing arrangement for a low temperature line. 4,099,74€, Cl. 285-119.000.

Koppe, Herbert: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Hoefke, Wolfgang; and Kohn, Franz Josef, 4,100,292, Cl. 424-273.00R.

Korelin, Vladimir Fedorovich: *See*—
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Kornhauser, Murray, to Safety Consultants. Energy absorbing bumper system. 4,099,759, Cl. 293-71.00P.

Korrenn, Heinz; and Voll, Horst, to Kugelfischer Georg Schafer & Co. Heavy-duty hydrostatic bearing. 4,099,801, Cl. 308-9.000.

Koskan, Larry P.: *See*—
Vossos, Peter H.; Mindick, Morris; and Koskan, Larry P., 4,100,258, Cl. 423-242.000.

Kourbetsos, John, to P. L. Porter Company. Hydraulic positioner with bidirectional detenting action. 4,099,602, Cl. 188-300.000.

Kozlov, Jury Stepanovich: *See*—
Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Schedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich, 4,099,334, Cl. 33-346.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Boer, Joachim; and Frankenhauser, Georg, 4,100,439, Cl. 310-57.000.

Krahmer, Jon L. Automatic release hospital thermometer. 4,099,414, Cl. 73-373.000.

Krall, Albert D.: *See*—
Schwee, Leonard J.; Irons, Henry R.; Anderson, Wallace F.; Scharnhorst, Kurt Peter; and Krall, Albert D., 4,100,609, Cl. 365-87.000.

Kraskin, Kenneth S.; and Hammad, Mohamed W., to Personal Products Company. Water-dispersible biodegradable compositions and containers and the like made therefrom. 4,099,976, Cl. 106-15.00R.

Krause, Gerhard, to Siemens Aktiengesellschaft. Opto-electronic two-way coupling. 4,100,423, Cl. 250-551.000.

Krause, Ruben Louis: *See*—
Baggett, Joseph McClendon; and Krause, Ruben Louis, 4,100,139, Cl. 528-196.000.

Krautkramer-Branson, Incorporated: *See*—
Niklas, Ludwig, 4,099,416, Cl. 73-602.000.

Kresge, James S., to General Electric Company. Electrical overvoltage surge arrester with varistor heat transfer and sinking means. 4,100,588, Cl. 361-127.000.

Kresse, Horst: *See*—
Weissflog, Wolfgang; Schubert, Hermann; Kresse, Horst; Wiegeleben, Adalbert; and Demus, Dietrich, 4,099,856, Cl. 350-350.000.

Kreucher, David L., to Wickes Corporation, The. Internal milling machine for milling crank pins. 4,099,431, Cl. 82-9.000.

Krezanoski, Joseph Z., to Cooper Laboratories, Inc. Clear, water-miscible, liquid pharmaceutical vehicles and compositions which gel at body temperature for drug delivery to mucous membranes. 4,100,271, Cl. 424-78.000.

Krichevsky, Mendel, to Ben-Gurion University of the Negev Research and Development Authority. Devices for controlling A.C. motors. 4,100,520, Cl. 336-30.000.

Krolla, Georg: *See*—
Faulstich, Marga; Neuroth, Norbert; Reitmayer, Franz; and Krolla, Georg, 4,099,834, Cl. 350-96.340.

Kronseder, Hermann: *See*—
Dullinger, Karl, 4,099,621, Cl. 209-98.000.

Kropa, Gomer E.: *See*—
Bradbury, Christopher G.; Buchan, Walter; Winiarski, Edward J.; and Kropa, Gomer E., 4,099,900, Cl. 425-313.000.

Krumholz, Frank C.: *See*—
Kanengieter, Glenn G.; and Krumholz, Frank C., 4,099,364, Cl. 56-1.000.

Krumme, Helmut: *See*—
Heinemann, Otto; Schossler, Werner; Lucke, Helmut; Krumme, Helmut; and Heiringhoff, Burkhard, 4,099,802, Cl. 308-9.000.

Krutsch, John R.: *See*—
Bubley, Henry J.; Oltra, Claude H.; and Krutsch, John R., 4,099,460, Cl. 101-44.000.

Kubo, Shigenaga: *See*—
Abe, Nobuyoshi; Kubo, Shigenaga; and Kanamaru, Kiyoshi, 4,100,074, Cl. 252-8.100.

Kubota, Tatsushi: *See*—
Mori, Mamoru; Yasumatsu, Jun; and Kubota, Tatsushi, 4,099,684, Cl. 242-107.000.

Kuboyama, Morio: *See*—
Ogasa, Katsuhiro; Kuboyama, Morio; Saito, Minoru; and Nagata, Kazuhiro, 4,100,022, Cl. 195-1.800.

Kugelfischer Georg Schafer & Co.: *See*—
Korrenn, Heinz; and Voll, Horst, 4,099,801, Cl. 308-9.000.

Kuhn-Kuhnenfeld, Franz; Kirsten, Dietmar; and Maier, Marianne, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Etching agent for III/V semiconductors. 4,100,014, Cl. 156-647.000.

Kuhne, Manfred; Kocher, Clemens; and Gallay, Jean Jacques, to Ciba-Geigy Corporation. Growth promoting feed additive oxadiazines. 4,100,283, Cl. 424-248.500.

Kuijk, Karel Elbert: *See*—
Dijkmans, Eise Carel; and Kuijk, Karel Elbert, 4,100,493, Cl. 325-38.00B.

Kumazaki, Sakato: *See*—
Maekawa, Iwao; Uchigasaki, Isao; and Kumazaki, Sakato, 4,100,120, Cl. 260-22.0CB.

Kumazawa, Koichi: *See*—
Kobayakawa, Masaki; Yawata, Kazufumi; Ohta, Kazuo; and Kumazawa, Koichi, 4,100,456, Cl. 313-497.000.

Kummer, Werner: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Hoefke, Wolfgang; and Kohn, Franz Josef, 4,100,292, Cl. 424-273.00R.

Kunieda, Naoshi: *See*—
Sato, Yuzuru; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenji; and Oya, Tadanori, 4,099,972, Cl. 96-29.00D.

Kunimi, Yuri, to Gillette Company, The. Thermostatically controlled electrical heater assembly. 4,100,397, Cl. 219-512.000.

Kuppenheimer, John D., Jr.: *See*—
Johnson, Philip M.; and Kuppenheimer, John D., Jr., 4,100,404, Cl. 250-199.000.

Kurabayashi, Sadasuke: *See*—
Muto, Hakaru; Kurabayashi, Sadasuke; Takatori, Yasushi; Yamaguchi, Isao; and Watanabe, Asao, 4,100,552, Cl. 346-162.000.

Kurka, Gerard: *See*—
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,557, Cl. 165-104.00S.
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,558, Cl. 165-104.00S.

Kuroda, Hiroshi: *See*—
Yoshimura, Tooru; and Kuroda, Hiroshi, 4,099,377, Cl. 60-276.000.

Kuroda, Masao; Kondo, Toshio; Ogawa, Toshio; and Ono, Sekijyuro, to Hitachi Medical Corporation. Ultrasonic tomography apparatus. 4,099,419, Cl. 73-626.000.

Kurple, William: *See*—
United States of America, National Aeronautics and Space Administration; Kobayashi, Herbert S.; Fowler, Joe; and Kurple, William, 4,100,531, Cl. 340-146.10E.

Kurz, Bruno F., deceased: *See*—
Ferro, Armand P.; and Kurz, Bruno F., deceased, 4,099,998, Cl. 148-187.000.

Kutnyak, Thomas A.; and Dunn, George T., to Automation Industries, Inc. Snap-in swivel end fitting. 4,099,744, Cl. 285-7.000.

Kuwako, Tomohisa, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electrical rotary machine. 4,100,443, Cl. 310-164.000.

Kuylenstierna, Ulf Vilhelm: *See*—
Reinhardt, Nils; Kuylenstierna, Ulf Vilhelm; and Alfredsson, Bengt Agne, 4,100,251, Cl. 423-63.000.

Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Schedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich. Dip angle data transmitter. 4,099,334, Cl. 33-346.000.

Kyburz, Emilio: *See*—
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,100,173, Cl. 260-333.000.

Lackey, Laurie M. Form for decorative wreath. 4,100,316, Cl. 428-10.000.

Laferty, John M.: *See*—
Chou, Eddie C.; Queneau, Paul B.; Laferty, John M.; and Carlberg, John R., 4,100,043, Cl. 204-108.000.

Lagermasini, Joseph P.: *See*—
Brennan, Leon E.; Lagermasini, Joseph P.; and Rarig, Larry L., 4,099,607, Cl. 198-341.000.

Laible, Roy C.; and Brynjolfsson, Ari, to United States of America, Army. Packing for cryogenic seal joint. 4,099,726, Cl. 277-1.000.

Laine, Paul Elis: *See*—
Ashorn, Theodore Heinrich Gustave; and Laine, Paul Elis, 4,100,155, Cl. 260-124.00R.

L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude: *See*—
Boulenger, Paul; Angelier, Nicole; and Torres, Jean-Pierre, 4,100,062, Cl. 210-14.000.

Lambert, Robert Wilson: *See*—
Atherton, Frank Ratcliffe; Hall, Michael John; Hassall, Cedric Herbert; Ringrose, Peter Stuart; and Lambert, Robert Wilson, 4,100,275, Cl. 424-211.000.

Lampertz, Horst: *See*—
Strunk, Ernst-Joachim, 4,099,355, Cl. 52-404.000.

Lamprecht, Walther, to Caterpillar Mitsubishi Ltd. Process for the determination of at least one of the isoenzymes of lactatedehydrogenase. 4,100,030, Cl. 195-103.50R.

Land, Edwin H., to Polaroid Corporation. Variable light transmission ophthalmic device. 4,099,858, Cl. 351-62.000.

Landon, James M. Holder for guitars and the like. 4,099,441, Cl. 84-327.000.

Landry, Alfred. Magnetic transmission. 4,100,441, Cl. 310-103.000.

Lang, John W., Jr., to Bell & Howell Company. Printing head assembly. 4,099,869, Cl. 355-108.000.

Langbein, Adolf: *See*—
Merz, Herbert; Walther, Gerhard; Langbein, Adolf; Stockhaus, Klaus; and Wick, Helmut, 4,100,288, Cl. 424-260.000.

Lange, Frederick F.; and Andersson, Clarence A., to Westinghouse Electric Corp. Si_3N_4 Hot-pressed with MgO. 4,099,979, Cl. 106-58.000.

Lannert, Kent P., to Monsanto Company. Ketal polycarboxylate compounds. 4,100,358, Cl. 560-180.000.

Lapson, William F.: *See*—
Kendall, Robert M.; and Lapson, William F., 4,099,620, Cl. 209-74.00R.

Larkin, John M.; and Chafetz, Harry, to Texaco Inc. Dispersant and lube oils containing same. 4,100,086, Cl. 252-50.000.

Lathrop, Jay W.: *See*—
Kilby, Jack S.; Lathrop, Jay W.; and Porter, Wilbur A., 4,100,051, Cl. 204-266.000.

Latrobe Steel Company: *See*—
Pugliese, Leonard A.; and Stroup, James P., 4,099,992, Cl. 148-11.50N.

Latsch, Reinard; and Bianchi, Valerio, to Robert Bosch GmbH. Method and apparatus for controlling an internal combustion engine. 4,099,493, Cl. 123-32.0EA.

Laubie, Michel: *See*—
Regnier, Gilbert; Canevari, Roger; Poignant, Jean-Claude; and Laubie, Michel, 4,100,286, Cl. 424-251.000.

Lauterbach, Horst, to Ciba-Geigy Corporation. Process for lacquering metals. 4,100,315, Cl. 427-379.000.

Lawrence, Jackson, to Cluett, Peabody & Co., Inc. Ammonia processing of fabrics-effective removal of residual ammonia. 4,099,911, Cl. 8-125.000.

Lawrenson, Peter John; and Hughes, Austin, to National Research Development Corporation. Electric stepper motors. 4,100,473, Cl. 318-696.000.

Lawson, Daniel D.: *See*—
United States of America, National Aeronautics and Space Administration; Ingham, John D.; and Lawson, Daniel D., 4,100,331, Cl. 429-13.000.
Lawson, John A.; and Betensky, Ellis I., to Vivitar Corporation. Wide angle objective. 4,099,849, Cl. 350-214.000.
Leach, Irby H. Method of molding aqueous settable slurries containing shredded open-cell polystyrene particles. 4,100,242, Cl. 264-115.000.
Lear Siegler, Inc.: *See*—
Chekirda, Russell F., 4,099,777, Cl. 297-375.000.
Leavens, Dwight E.: *See*—
Phillips, C. Frank; and Leavens, Dwight E., 4,100,181, Cl. 260-416.000.
Le Berre, Serge: *See*—
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Lectrofood, Corp.: *See*—
Theimer, Ernst Theodore; and Bissett, Robert Stuart, 4,099,454, Cl. 99-358.000.
Theimer, Ernst Theodore; and Heinze, George E., 4,100,302, Cl. 426-90.000.
Leder, Lewis B., to Xerox Corporation. Coating method to improve adhesion of photoconductors. 4,099,969, Cl. 96-1.50R.
Lee, Harry W., Jr., to Reynolds Metals Company. Method of trouble-shooting can presses. 4,099,475, Cl. 113-116.0QA.
Lee, Jeffrey A.: *See*—
Christensen, Bryan L.; Sampson, William J.; Brogger, Ronald L.; and Lee, Jeffrey A., 4,099,285, Cl. 15-83.000.
Lee, Robert Wilton, to Argosystems, Inc. Remote probing apparatus and method. 4,099,878, Cl. 356-128.000.
Leesona Corporation: *See*—
Bradbury, Christopher G.; Buchan, Walter; Winiarski, Edward J.; and Kropa, Gomer E., 4,099,900, Cl. 425-313.000.
Leggett & Platt, Incorporated: *See*—
Bustos, Rafael T., 4,099,625, Cl. 211-49.00R.
Crum, Donald; Goff, McKinley; and Hampton, Edward L., 4,099,776, Cl. 297-329.000.
Sandham, Edwin C., 4,099,774, Cl. 297-298.000.
Legrand, Jules: *See*—
Rondeaux, Louis; Legrand, Jules; and Baelde, Claude, 4,099,953, Cl. 65-335.000.
Legrow, Gary E.: *See*—
Brooks, William T.; and Legrow, Gary E., 4,100,090, Cl. 252-63.700.
Lehr, Werner, to Bayerische Motoren Werke Aktiengesellschaft. Retention installation for children in motor vehicles. 4,099,778, Cl. 297-386.000.
Leibach, Heinrich, to Motoren- und Turbinen-Union Munchen GmbH. Device for control of an aircraft. 4,099,671, Cl. 239-265.290.
Leidal, Shirley Margaret, to Upjohn Company, The. Stem adjustment seal for reaction injection molding machine. 4,099,919, Cl. 23-252.00R.
Leigh, Peter Alexander: *See*—
Cooper, Kenneth; Groves, Ian Stanley; Leigh, Peter Alexander; McIntyre, Neil; O'Hara, Sydney; and Speight, John Donald, 4,099,318, Cl. 29-578.000.
Lemieux, Raymond Urgel; and Vukov, Rastko, to Polysar Limited. Crosslinking of hydroxyl-containing polymers with polyaldehyde compounds. 4,100,137, Cl. 526-21.000.
Lemke, Timothy Allen; and Shultz, Edmond Franklin, Jr., to AMP, Incorporated. Carrier strip mounted electrical components. 4,099,615, Cl. 206-329.000.
Lennox Industries, Inc.: *See*—
Burnham, Roger R.; Chapin, Merlin K.; Cook, David A.; Gilles, Theodore C.; and Williams, Billy L., 4,099,553, Cl. 165-22.000.
Lenox Machine Company: *See*—
Grody, Donald R.; and Fitzpatrick, Donald C., 4,099,711, Cl. 271-64.000.
Leo Pharmaceutical Products Ltd. A/S: *See*—
von Daehne, Welf; and Rasmussen, Poul Rodbroe, 4,100,276, Cl. 424-238.000.
Leonard, Thomas E.; and Buckner, Walter E., to Lucky Manufacturing Company. Gondola car loader. 4,099,635, Cl. 214-152.000.
Leotta, Samuel S. Collapsible work station. 4,099,809, Cl. 312-140.200.
Lerman, Michael A., to Standard Oil Company (Indiana). Greater water resistance and shorter drying time in water soluble enamel paints. 4,100,119, Cl. 260-22.0CB.
Leroux, Adrien: *See*—
Delisle, Jules; Leroux, Adrien; and Mathieu, Serge, 4,100,428, Cl. 307-97.000.
Lesser, Mark B., to Rockwell International Corporation. Multi-phase and gate. 4,100,430, Cl. 307-205.000.
Lester, Allan Gerald. Building panels, and a building and method utilizing building panels. 4,099,357, Cl. 52-533.000.
Lever Brothers Company: *See*—
Pader, Morton, 4,100,269, Cl. 424-49.000.
Levin, Berton P., to Sierracin Corporation, The. Laminated electrically heatable window with electrical connectors. 4,100,398, Cl. 219-541.000.
Levine, Isaac Jacob; and Karol, Frederick John, to Union Carbide Corporation. Titanium-modified silyl chromate catalysts for ethylene polymerization. 4,100,105, Cl. 252-429.00R.
Lewalter, Jurgen: *See*—
Dunwald, Willi; Lewalter, Jurgen; Merten, Rudolf; and Muller, Hans-Jurgen, 4,100,144, Cl. 260-860.000.
Lewis, David Roger: *See*—
Cox, Terence Allan; and Lewis, David Roger, 4,099,815, Cl. 312-330.00R.
Lewis, Pauls & Associates, Ltd.: *See*—
Boxer, Leo M.; and Boxer, Robert W., 4,099,639, Cl. 215-209.000.
Lewis, Peter Frederick: *See*—
Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,100,458, Cl. 315-39.550.
Ley, Anthony John: *See*—
Metcalf, Eric; and Ley, Anthony John, 4,100,420, Cl. 250-561.000.
Leyer, Helmut: *See*—
Hoppe, Peter; Leyer, Helmut; and Muller, Johann, 4,099,280, Cl. 9-6.00P.
Li, George S., to Standard Oil Company, The. Indene-chlorobutyl rubber copolymers. 4,100,226, Cl. 260-879.000.
Libbey, William J., to Continental Oil Company. Separation of alkyl alcohols from alkyldimethylamines. 4,100,209, Cl. 568-918.00D.
Life Savers, Inc.: *See*—
Friello, Dominick R.; and Roy, Raymond L., 4,100,301, Cl. 426-3.000.
Lillis, William Joseph: *See*—
Duffy, William Thomas; and Lillis, William Joseph, 4,100,433, Cl. 307-229.000.
Lilly Industries Ltd.: *See*—
Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, 4,100,350, Cl. 560-20.000.
Dunwell, David William; Evans, Delme; and Hicks, Terence Alan, 4,100,168, Cl. 260-299.000.
Lindauer, Rolf: *See*—
Binder, Georg; Lindauer, Rolf; Sohnle, Rudiger; and Wahler, Harald, 4,100,440, Cl. 310-89.000.
Lindberg, Allen W.; and Gantzert, Thomas R., to ACF Industries, Inc. Air metering apparatus. 4,100,234, Cl. 261-121.00B.
Linde Aktiengesellschaft: *See*—
Skolaude, Werner, 4,099,945, Cl. 62-30.000.
Lindsey, William C.; Meyr, Heinrich; and King, Peter C., to W. C. Lindsey Inc. Correlative tracking system with lock indicator. 4,100,503, Cl. 331-1.00A.
Lipschutz, Paul, to Societe Neiman SA. Lock key, method for its manufacture and lock employing this key. 4,099,398, Cl. 70-406.000.
Liquichimica Robassomero S.p.A.: *See*—
Peditto, Andrea; Fossati, Franco; and Petrillo, Vincenzo, 4,100,085, Cl. 252-42.700.
Lischka, Siegfried: *See*—
Ehlers, Klaus-Peter; Lischka, Siegfried; and Burkhardt, Siegfried, 4,100,261, Cl. 423-309.000.
Littelfuse, Inc.: *See*—
Aryamane, Avinash P., 4,099,321, Cl. 29-623.000.
Schmidt, John, Jr.; and Aryamane, Avinash, 4,099,320, Cl. 29-623.000.
Tait, Robert J., 4,099,322, Cl. 29-623.000.
Liu, Chao-Min: *See*—
Westley, John; and Liu, Chao-Min, 4,100,171, Cl. 260-326.330.
Lloyd, Raymond A.: *See*—
Feilchenfeld, Michal M.; Daggett, Kenneth E.; and Lloyd, Raymond A., 4,099,668, Cl. 235-304.000.
Loads, Frederic Walter, to Kapag Manufacturing Co. Limited. Production of turf. 4,099,345, Cl. 47-56.000.
Lockheed Aircraft Corporation: *See*—
Cronin, Michael Joseph, 4,100,586, Cl. 361-58.000.
Loctite (Ireland) Limited: *See*—
O'Sullivan, Denis Joseph, 4,100,141, Cl. 526-301.000.
Loeb, Leopold: *See*—
Spauschus, Hans O.; and Loeb, Leopold, 4,100,092, Cl. 252-70.000.
Logander, Pehr Ingemar. Lottery ticket. 4,099,721, Cl. 273-139.000.
Lombardo, Michael S.; Jacovich, Elaine F.; D'Ottavio, Eugene D.; and Grunwald, John J., to MacDermid Incorporated. Method of making metal-plastic laminates. 4,100,312, Cl. 427-96.000.
Lonati, Francesco. Yarn cutting and gripping device for a circular knitting machine. 4,099,392, Cl. 66-140.00R.
Lonza A. G.: *See*—
Eriksson, Jan Bertil; and Dadekian, Zaven Armen, 4,100,210, Cl. 260-652.00R.
Lonza, Ltd.: *See*—
Stefani, Giancarlo; and Fontana, Pietro, 4,100,106, Cl. 252-437.000.
Lorenz, Leo J., to Massey-Ferguson Inc. Roof construction. 4,099,766, Cl. 296-137.00B.
Loty, Charles, to Commissariat a l'Energie Atomique. Photoelectric shutter tube with microduct wafer incorporated in a wave propagation line which is integrated in said shutter tube. 4,100,406, Cl. 250-213.0VT.
Louit, Henri, to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A. Method for measuring the pre-stress in hoop-bound anuluses of rectangular cross-section and made of piezoelectric ceramic material. 4,099,407, Cl. 73-88.50R.
Loustaunau, Louie E., to Raymond Lee Organization, Inc., a part interest. Rotation indicators for cassette reels. 4,099,480, Cl. 116-135.000.
Lowe, Robert E.: *See*—
Seibold, Robert W.; Parechanian, Haig S.; Weatherill, William T.; and Lowe, Robert E., 4,100,322, Cl. 428-257.000.
Lowery, Fred. Skateboard brake. 4,099,734, Cl. 280-11.200.
Lowrey, Thomas Patrick, to Walker, Harry C.; and Sukalac, David E., part interest to each. Therapeutic device. 4,099,523, Cl. 128-75.000.

Lubrizol Corporation, The: *See—*
Clason, Donald Lynn; Pindar, John Francis; and Cohen, Jerome Martin, 4,100,082, Cl. 252-33.400.
Luc, Andre R., to Tridon-Serflex S.A. Screw type clamping collar. 4,099,304, Cl. 24-274.00R.
Lucas Electrical Limited: *See—*
Hawthorne, Horace Stanley, 4,099,329, Cl. 32-2.000.
Lucas Industries Limited: *See—*
Askew, James Martin Anderton, 4,099,895, Cl. 417-499.000.
Luce, David A., to Norlin Music, Inc. Electronic musical instrument with dynamically responsive keyboard. 4,099,439, Cl. 84-1.260.
Luck, Russell M.: *See—*
Gainer, Gordon C.; and Luck, Russell M., 4,099,805, Cl. 308-240.000.
Lucke, Helmut: *See—*
Heinemann, Otto; Schossler, Werner; Lucke, Helmut; Krumme, Helmut; and Heiringhoff, Burkhard, 4,099,802, Cl. 308-9.000.
Lucky Manufacturing Company: *See—*
Leonard, Thomas E.; and Buckner, Walter E., 4,099,635, Cl. 214-152.000.
Ludwigson, David C., to United States Steel Corporation. Method for testing sheet metals. 4,099,408, Cl. 73-95.000.
Lundberg, Robert D.: *See—*
Sartori, Guido; and Lundberg, Robert D., 4,100,128, Cl. 260-33.6UA.
Lundstrom, Goran; and Huijsers, Willem, to Hugin Kassaregister AB. Keyboard key with changeable indicia. 4,100,402, Cl. 235-145.00R.
Lush, William, to Ideal-Aerosmith, Inc. Self-cleaning precision metering valve. 4,099,703, Cl. 251-122.000.
Luther, Ronald B. Method for making a cannula using a laser and the cannula made thereby. 4,100,393, Cl. 219-121.0LM.
Luthi, Johannes: *See—*
Beurer, Peter; Luthi, Johannes; and Portaleoni, Libero, 4,100,071, Cl. 210-197.000.
Lutz, Edgar: *See—*
Kania, Siegmund; Zweigart, Gerhard; Luz, Karl; and Lutz, Edgar, 4,099,767, Cl. 296-137.00A.
Luvison, Angelo; and Pirani, Giancarlo, to CSELT - Centro Studi e Laboratori Telecomunicazioni. Adaptive method of and means for recovering digital signals. 4,100,495, Cl. 325-323.000.
Luz, Karl: *See—*
Kania, Siegmund; Zweigart, Gerhard; Luz, Karl; and Lutz, Edgar, 4,099,767, Cl. 296-137.00A.
Luzzi, Antoine, to Societe General de Constructions Electriques et Mecaniques Alsthom s.a. Optical probe for the measurement of speeds in a fluid flow. 4,099,870, Cl. 356-28.000.
Lyle Development, Inc.: *See—*
Oberloier, William, 4,099,902, Cl. 425-388.000.
Lyons, Charles E.: *See—*
Bredeweg, Corwin J.; Dennis, Kent S.; and Lyons, Charles E., 4,100,227, Cl. 260-880.00R.
Dennis, Kent S.; Lyons, Charles E.; and Bredeweg, Corwin J., 4,100,228, Cl. 260-880.00R.
Lyons, James E.: *See—*
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,100,216, Cl. 260-666.0PY.
Lyons, John E., to Eutectic Corporation. Apparatus for applying metal coatings to a metal substrate. 4,099,481, Cl. 118-8.000.
Lytle, Dan R.; and Burski, Ronald C., to Dataproducts Corporation. Position and velocity sensors. 4,100,480, Cl. 323-51.000.
M&T Chemicals Inc.: *See—*
Jongkind, Jan C., 4,100,038, Cl. 204-38.00B.
MAC Valves, Inc.: *See—*
Neff, James A., 4,100,519, Cl. 335-262.000.
Macan Engineering & Manufacturing Company, Inc.: *See—*
Belt, Kenneth W.; and McCarrell, Stuart G., 4,100,505, Cl. 331-71.000.
MacChesney, John Burnette: *See—*
French, William George; and MacChesney, John Burnette, 4,099,835, Cl. 350-96.300.
MacDermid Incorporated: *See—*
Lombardo, Michael S.; Jacovich, Elaine F.; D'Ottavio, Eugene D.; and Grunwald, John J., 4,100,312, Cl. 427-96.000.
Machlett Laboratories, Inc., The: *See—*
Suffredini, Joseph R.; and Hagar, Robert A., 4,100,445, Cl. 313-101.000.
MacKay, Patrick W.; Vera, Enrique Martinez; and de la Pena, Ramon, to Grupo Industrial Alfa, S.A. Method and apparatus for measuring and controlling the percentage reduction of ore in a moving bed gaseous reduction reactor. 4,099,962, Cl. 75-26.000.
MacKay, Patrick W., to Fierro Esponja, S.A. Method for the batchwise reduction of metal ores. 4,099,963, Cl. 75-35.000.
MacKellar, Jeremy Margreave; Dryden, Christopher Michael; and Brazendale, Peter Alan, to Plessey S.A. Limited. Sequential initiation of explosions. 4,099,467, Cl. 102-217.000.
Mackenberger, Ludwig: *See—*
Reinke, Friedhelm; Mackenberger, Ludwig; and Siefert, Eckhard, 4,100,387, Cl. 219-10.570.
Mackenroth, Einhard. Structural joints. 4,099,887, Cl. 403-4.000.
Mackenzie, Harold B.; and Anderson, Ingvar G., to New Life Foundation. Fuel handling, metering and preparation apparatus and method. 4,099,473, Cl. 110-219.000.
Mackert, Robert J.; Storm, Donald P.; and Hoch, Manfried L., to International Harvester Company. Gathering unit control apparatus. 4,099,368, Cl. 56-208.000.
MacRae, Donald R.; Gold, Richard G.; Sandall, William R.; and Thompson, Charles D., to Bethlehem Steel Corporation. Method of producing vanadium. 4,099,958, Cl. 75-0.5BA.
Maekawa, Iwao; Uchigasaki, Isao; and Kumazaki, Sakato, to Hitachi Chemical Company, Ltd. Resinous composition. 4,100,120, Cl. 260-22.0CB.
Maertz, Josef: *See—*
Elsholz, Joachim; Bortfeld, Manfred; Maertz, Josef; and Poser, Erhard, 4,099,770, Cl. 297-216.000.
Maffet, Vere, to UOP Inc. Organic waste drying process. 4,099,336, Cl. 34-12.000.
Magan, Phillip R., to Olin Corporation. Stabilized solutions of sodium dithionite. 4,100,098, Cl. 252-188.000.
Maggiulli, Cataldo Aldino; Burness, Donald MacArthur; and Perkins, William Clarence, to Eastman Kodak Company. Use of novel ethers as oxydimethylating agents. 4,100,200, Cl. 260-609.00R.
Magistro, Angelo Joseph, to BF Goodrich Company, The. Process for preparation of ethylene and vinyl chloride from ethane. 4,100,211, Cl. 260-656.00R.
Magnavox Company, The: *See—*
Devendorf, Alan E., 4,099,646, Cl. 220-324.000.
Magnussen, Robert O., Jr. Modular rack. 4,099,626, Cl. 211-60.00R.
Maier, Marianne: *See—*
Kuhn-Kuhnenfeld, Franz; Kirsten, Dietmar; and Maier, Marianne, 4,100,014, Cl. 156-647.000.
Maier, Roger F.; Milligan, Jimmy L.; Bahnfleth, William A.; and Taylor, James L., to Caterpillar Tractor Co. Seal construction for vehicles. 4,099,763, Cl. 296-28.00C.
Mandt, Mikkel G., to Houdaille Industries, Inc. Method for polymer dissolution. 4,100,614, Cl. 366-154.000.
Manier, Francis Rene Daniel; and Caullet, Pierre Leon Adolphe, to Produits Chimiques Ugine Kuhlmann. Spin dyeing of acrylic fibres. 4,100,131, Cl. 260-42.210.
Mannesmannrohren-Werke, A.G.: *See—*
Biller, Horst, 4,099,402, Cl. 72-234.000.
Manning, James B.: *See—*
Bretthauer, Harry, 4,099,289, Cl. 15-244.00R.
Marblehead Lime Company: *See—*
Henery, Maurice D.; Snyder, Ernest B.; and Walker, Walter W., 4,099,964, Cl. 75-52.000.
Marchetti, Franco: *See—*
Reggiani, Marcello; and Marchetti, Franco, 4,100,510, Cl. 331-107.00R.
Marconi Company Limited, The: *See—*
Wisbey, Philip Henry; and Elliot, George, 4,099,855, Cl. 350-333.000.
Wisbey, Philip Henry, 4,100,511, Cl. 331-107.00A.
Marconi, Walter: *See—*
Palladino, Nicola; Mazzei, Marcello; and Marconi, Walter, 4,100,334, Cl. 526-1.000.
Prosperi, Giulio; Marconi, Walter; Giovenco, Silvia; and Morisi, Franco, 4,100,029, Cl. 195-68.000.
Marcraft Recreation Inc.: *See—*
Marks, Nathan, 4,099,718, Cl. 273-73.00C.
Maret, Bernard: *See—*
Maret, Jean Paul; and Maret, Bernard, 4,099,581, Cl. 173-133.000.
Maret, Jean Paul; and Maret, Bernard. Explosive-cartridge powered hammer or impact tool. 4,099,581, Cl. 173-133.000.
Margen, Peter Heinrich Erwin; Bosaeus, Jan Anders; and Skarud, Bengt Olof Roland, to Aktiebolaget Atomenergi. Convector having a flattened plastic tube spiral. 4,099,555, Cl. 165-55.000.
Marine Resources, Inc.: *See—*
Stahl, Oliver B.; and Byron, Harlund L., 4,100,539, Cl. 340-546.000.
Marks, Gerald R.: *See—*
Cook, Edward H., Jr.; and Marks, Gerald R., 4,100,050, Cl. 204-252.000.
Marks, Nathan, to Marcraft Recreation Inc. Racquet frame construction. 4,099,718, Cl. 273-73.00C.
Marquis, Edgar E., to Robertshaw Controls Company. Electrical switch construction and method of making the same. 4,100,381, Cl. 200-38.00A.
Marshall, Sidney W., to Xerox Corporation. Signal generator for raster type scanners. 4,100,408, Cl. 250-230.000.
Marshall, Winston S.: *See—*
Zimmerman, Dennis M.; and Marshall, Winston S., 4,100,166, Cl. 260-289.00D.
Martin, Alfred Charles, to Westland Aircraft Limited. Helicopter rotors. 4,099,892, Cl. 416-134.00A.
Martin-Decker Company, a division of Gardner-Denver: *See—*
Bell, Leo A., 4,099,582, Cl. 175-5.000.
Martin, Frank Stephen; Melvin, Terence; and Pieroni, Joseph Kirby, to Uniroyal, Inc. Method of making adjuvant for elastomeric composition. 4,100,182, Cl. 260-429.900.
Martin, Merrill D. Automatic sheet handling apparatus. 4,099,712, Cl. 271-184.000.
Martin, Richard Hugo, to Olin Corporation. Method for electrically perforating moving webs. 4,100,396, Cl. 219-384.000.
Martin, Robert P., Sr. Sound attenuating engine cover. 4,099,590, Cl. 180-69.00C.
Martin, T. Edward, to Connelly, Arthur J., a part interest. Rate of penetration recorder. 4,099,410, Cl. 73-151.500.
Martines, Vincent C.; and Campbell, Ramsey G., to Stauffer Chemical Company. Production of perchloromethyl mercaptan. 4,100,190, Cl. 260-543.00H.
Maruhnic, Peter: *See—*
Wolk, Ronald H.; Rovesti, William; and Maruhnic, Peter, 4,100,107, Cl. 252-443.000.

Maruo, Masaya: *See*—
Arikawa, Hiroo; and Maruo, Masaya, 4,100,523, Cl. 337-163.000.

Marvin Glass & Associates: *See*—
Hicks, Alan A.; Brand, Derek A.; and Morrison, Howard J., 4,099,330, Cl. 33-18.00R.

Marwitz, Hans-Gunther v.d.: *See*—
Muth, Hans-Albrecht; Reissig, Dirk; and Marwitz, Hans-Gunther v.d., 4,099,645, Cl. 220-304.000.

Mascher, Werner. Filter-type gas mask and breathing device arranged in a carrying case. 4,099,526, Cl. 128-146.600.

Mascherin, Enio. Coin holder having rib retained closure. 4,099,532, Cl. 133-5.00A.

Maschinenfabrik Hellmut Geiger: *See*—
Hartmann, Ludwig, 4,100,063, Cl. 210-17.000.

Masco Corporation of Indiana: *See*—
Fathauer, George H.; Mathis, Cecil Ernest; and Williamson, Warren L., 4,100,497, Cl. 325-470.000.

Mascotte, Lawrence L.; and Rayson, Robert L. Grill and brush guard and utility rack for a vehicle. 4,099,760, Cl. 293-73.000.

Mase, Yoji, to Kondo Manufacturing Co., Ltd. Feed mechanism. 4,099,450, Cl. 91-403.000.

Mason, Peter Alan: *See*—
Schaefer, Peter; Mason, Peter Alan; and Yates, William Harold, 4,100,142, Cl. 526-68.000.

Maspero, Federico; and Perrotti, Emilio, to Snam Progetti S.p.A. Process for the production of unsaturated compounds. 4,100,208, Cl. 568-902.000.

Massachusetts Institute of Technology: *See*—
Shapiro, Ascher H., 4,100,602, Cl. 364-715.000.

Massey-Ferguson Inc.: *See*—
Lorenz, Leo J., 4,099,766, Cl. 296-137.00B.

Mathews, Robert P. Seat adapted to be mounted on vehicle tire. 4,099,771, Cl. 297-217.000.

Mathieu, Serge: *See*—
Delisle, Jules; Leroux, Adrien; and Mathieu, Serge, 4,100,428, Cl. 307-97.000.

Mathis, Cecil Ernest: *See*—
Fathauer, George H.; Mathis, Cecil Ernest; and Williamson, Warren L., 4,100,497, Cl. 325-470.000.

Matsui, Akio: *See*—
Horiuchi, Kaoru; Matsui, Akio; and Okamoto, Yoshio, 4,099,988, Cl. 148-3.000.

Matsui, Sei, to Nippon Kogaku K.K. Wide angle photographic lens. 4,099,850, Cl. 350-215.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Akiyoshi, Tsuyoshi; Yamaguchi, Namio; and Yamamoto, Keisuke, 4,100,496, Cl. 325-369.000.
Nishioka, Matsuo, 4,100,384, Cl. 200-160.000.

Matsuzaki, Hideo; and Yajima, Keiji, to Hitachi, Ltd. Apparatus for filling liquid crystal into the cells of liquid crystal display devices. 4,099,550, Cl. 141-51.000.

Matthews, Frank M.; and McClain, Terry O. Safety buckle. 4,099,306, Cl. 24-69.0SB.

Mattoon, Roland W. Device for limiting leakage from well head stuffing box assembly. 4,099,562, Cl. 166-84.000.

Matusek, Chester Joseph: *See*—
Johnson, David Leroy; and Matusek, Chester Joseph, 4,099,324, Cl. 29-739.000.

Maus, Leo Donald, to Exxon Production Research Company. Gas lift system for marine drilling riser. 4,099,583, Cl. 175-7.000.

Max Rittenbaum, Inc.: *See*—
Rittenbaum, Max; and Rittenbaum, Jeffrey A., 4,099,288, Cl. 15-228.000.

May & Baker Limited: *See*—
Gallant, John Henry; and Johnson, Michael Robert Thomas, 4,100,542, Cl. 340-518.000.

Mayer, Ronald Yves: *See*—
Woytiuk, Leo Victor; Mayer, Ronald Yves; and Kepes, George B., 4,100,002, Cl. 156-48.000.

Mazanek, Jan; Blahak, Johannes; Wagner, Kuno; and Ziemann, Heinz, to Bayer Aktiengesellschaft. Polyurethane foams from polyether polyols which contain amide groups. 4,100,116, Cl. 521-167.000.

Mazodier, Jean-Louis: *See*—
Perrot, Rene; and Mazodier, Jean-Louis, 4,099,314, Cl. 29-420.000.

Mazzei, Marcello: *See*—
Palladino, Nicola; Mazzei, Marcello; and Marconi, Walter, 4,100,334, Cl. 526-1.000.

Mazzeb, Charles F.; and Waddington, William T., to Amerace Corporation. Feed-through terminal block. 4,099,826, Cl. 339-198.00R.

McCabe, Francis J. Telescoping heat responsive releasing means. 4,099,292, Cl. 16-48.500.

McCain, G. Howard, to Diamond Shamrock Corporation. Electrolytic cell membrane and method of preparation by plasma polymerization of polyamide or polytetrafluoroethylene thin films onto polymeric substrates. 4,100,113, Cl. 521-38.000.

McCann, Thomas J.; and Regan, Ernest E., to Dowdflor Corporation. Actinic radiation cured coating for cushioned sheet goods and method. 4,100,318, Cl. 428-159.000.

McCarrell, Stuart G.: *See*—
Belt, Kenneth W.; and McCarrell, Stuart G., 4,100,505, Cl. 331-71.000.

McCarroll, John James: *See*—
Brown, David Emmerson; Clark, John Trevor Kent; McCarroll, John James; and Sims, Malcolm Leslie, 4,099,990, Cl. 148-6.350.

McCarthy, Robert O. Animal leg brace. 4,099,525, Cl. 128-87.00R.

McCarty, William H., to Mobil Oil Corporation. Ultraviolet curable aqueous coatings. 4,100,047, Cl. 204-159.230.

McClain, Dorothee M.; and Vest, Betty L., to National Distillers and Chemical Corp. Finely divided saponified ethylene-vinyl acetate interpolymers. 4,100,335, Cl. 526-10.000.

McClain, Terry O.: *See*—
Matthews, Frank M.; and McClain, Terry O., 4,099,306, Cl. 24-69.0SB.

McClelland, Donald H.: *See*—
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,099,401, Cl. 72-147.000.

McCombie, Alan Keith, to Molins Machine Company Limited. Apparatus for feeding articles. 4,099,608, Cl. 198-347.000.

McConeghy, Richard H.: *See*—
Baranowski, Stephen W.; and McConeghy, Richard H., 4,100,426, Cl. 307-41.000.

McConnaughey, Paul W.: *See*—
Vancheri, Frank J.; Nebash, Stanley P.; and McConnaughey, Paul W., 4,099,939, Cl. 55-246.000.

McDonald, Byron A. Digester and process for converting organic matter to methane and fertilizer. 4,100,023, Cl. 195-27.000.

McDonnell Douglas Corporation: *See*—
Seibold, Robert W.; Parechanian, Haig S.; Weatherill, William T.; and Lowe, Robert E., 4,100,322, Cl. 428-257.000.

McGann, Rodney: *See*—
Paull, Peter L.; and McGann, Rodney, 4,099,382, Cl. 60-648.000.
Paull, Peter L.; and McGann, Rodney, 4,099,383, Cl. 60-648.000.

McGann, William E., to Harris Corporation. Band rejection filter having integrated impedance inverter-tune cavity configuration. 4,100,504, Cl. 331-39.000.

McGann, William Edward, to Harris Corporation. Microcircuit device including hybrid circuit carrier. 4,100,589, Cl. 361-399.000.

McGee, Donald J., to H & H Equipment Co. Spring-air tandem suspension. 4,099,740, Cl. 280-678.000.

McGrew, James D. Method of forming eye splice in double braided line. 4,099,750, Cl. 289-1.500.

McIntire, John E.: *See*—
McIntire, Kendrick H.; and McIntire, John E., 4,099,511, Cl. 126-190.000.

McIntire, Kendrick H.; and McIntire, John E. Removable fuel door on a wood burning stove. 4,099,511, Cl. 126-190.000.

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Cooper, Kenneth; Groves, Ian Stanley; Leigh, Peter Alexander; McIntyre, Neil; O'Hara, Sydney; and Speight, John Donald, 4,099,318, Cl. 29-578.000.

McKearin, John W. Portable book rack. 4,099,624, Cl. 211-42.000.

McKellar, Robert L.: *See*—
Jueckstock, Dale Allen; and Hindman, Thomas Wayne, Sr., 4,099,283, Cl. 10-107.0PH.

McKinney, Claude O., to Standard Oil Company (Indiana). Apparatus for regeneration of catalyst. 4,099,927, Cl. 23-288.00B.

McKinney Manufacturing Company: *See*—
Gwozdz, Joseph W.; Biesecker, James E.; and Snyder, Charles R., 4,099,753, Cl. 292-177.000.

McLellan, Norvel Jeff. Combination incandescent/fluorescent lighting system. 4,100,462, Cl. 315-179.000.

McMackins, Dudley E.: *See*—
Hobbs, Charles F.; and McMackins, Dudley E., 4,100,194, Cl. 260-576.000.
Hobbs, Charles F.; and McMackins, Dudley E., 4,100,196, Cl. 260-585.00D.

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McNamee, Gary M.: *See*—
Christenson, Christopher P.; and McNamee, Gary M., 4,099,984, Cl. 134-2.000.
Christenson, Christopher P.; Faller, John W.; and McNamee, Gary M., 4,100,183, Cl. 260-438.100.

McNeal, Walter P., to General Electric Company. Method of making a dynamoelectric machine insulator. 4,100,005, Cl. 156-73.100.

McRae, Duncan Ross. Solar energy collector. 4,099,517, Cl. 126-271.000.

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Redmond, Stephen L.; Means, James E.; and Osburn, Michael R., 4,099,466, Cl. 102-215.000.

Mears, Whitney Harris, to Allied Chemical Corporation. Method and apparatus for cooling electrical apparatus using vapor lift pump. 4,100,366, Cl. 174-15.00R.

Medler, Albert S.; and Myers, Donald L., to Plastigage Corporation. Apparatus for forming resin embedded antenna. 4,100,013, Cl. 156-441.000.

Meier, Joseph F.: *See*—
Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., 4,100,327, Cl. 428-339.000.

Meihofer, Edward F.; Corcoran, George F.; and Clifford, John W., to Butler Automatic, Inc. Driven nip roll splicer. 4,100,012, Cl. 156-351.000.

Meiller, Francois; and Mirabel, Bernard, to Rhone-Poulenc Industries.

Method of separating proteins by ion exchange. 4,100,149, Cl. 260-112.00R.
Meinzer, Willy L., to Viking Industries, Inc. Non-explosive initiator. 4,099,818, Cl. 339-45.00R.
Melnichuk, Nikolai Ivanovich: *See—*
Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.
Melvin, Terence: *See—*
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Mendelsohn, Charles Richard, deceased; and Mendelsohn, Phyllis Jane, executrix. Stabilized kite. 4,099,690, Cl. 244-153.00R.
Mendelsohn, Phyllis Jane, executrix: *See—*
Mendelsohn, Charles Richard, deceased; and Mendelsohn, Phyllis Jane, executrix, 4,099,690, Cl. 244-153.00R.
Menth, Anton; Nagel, Hartmut; and Perry, Antony James, to BBC Brown, Boveri & Company, Ltd. Copper-hardened permanent-magnet alloy. 4,099,995, Cl. 148-101.000.
Mentrup, Anton: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,100,282, Cl. 424-246.000.
Mercier, Jules, to Rhone-Poulenc Industries. Recovery of acetic acid from dilute aqueous solutions thereof. 4,100,189, Cl. 260-541.000.
Merck & Co., Inc.: *See—*
Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Hoffman, William, 4,100,294, Cl. 424-275.000.
Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,100,193, Cl. 260-563.00P.
Vander Zwan, Michael C., 4,100,159, Cl. 544-277.000.
Merrill, Edward W., to High Voltage Engineering Corporation. Contact lens having a smooth surface layer of a hydrophilic polymer. 4,099,859, Cl. 351-160.000.
Merten, Rudolf: *See—*
Dunwald, Willi; Lewalter, Jurgen; Merten, Rudolf; and Muller, Hans-Jurgen, 4,100,144, Cl. 260-860.000.
Merz AG Dulliken: *See—*
Vig, Istvan, 4,099,889, Cl. 408-239.00R.
Merz, Herbert; Walther, Gerhard; Langbein, Adolf; Stockhaus, Klaus; and Wick, Helmut, to Boehringer Ingelheim GmbH. N-Tetrahydrofurfuryl-noroxymorphones, their salts, and analgesic compositions and methods employing them. 4,100,288, Cl. 424-260.000.
Meserole, Robert Henry, to Johns-Manville Corporation. Air duct connecting assembly. 4,099,747, Cl. 285-174.000.
Messerschmitt-Bolkow-Blohm GmbH: *See—*
Born, Gunthard; Hermansdorfer, Hans; Sepp, Gunther; and Grosch, Gerhard, 4,100,507, Cl. 331-94.50G.
Singelmann, Dietrich; Strobl, Heinrich; and Munding, German, 4,099,445, Cl. 89-7.000.
Messier, Russell F.; and Wolfe, Robert W., to GTE Sylvania Incorporated. Europium-activated alkaline earth fluorohalide x-ray phosphors and method for preparing the same. 4,100,101, Cl. 252-301.40H.
Metcalf, Brian Walter; and Jung, Michel. α-Acetylenic derivatives of histamine and related compounds. 4,100,349, Cl. 548-337.000.
Metcalf, Eric; and Ley, Anthony John, to Solartron Electronic Group Limited, The. Displacement transducers. 4,100,420, Cl. 250-561.000.
Metropolitan Wire Corporation: *See—*
Becker, Frederick R., III, 4,099,735, Cl. 280-79.300.
Mettler Instrumente, AG: *See—*
Kaufmann, Peter, 4,099,587, Cl. 177-210.0EM.
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Neumann, Henning; Schalausky, Horst; and Britschinn, Horst, 4,099,656, Cl. 224-5.00W.
Mews, Inc.: *See—*
Evans, Edgar J., 4,100,529, Cl. 340-32.000.
Meyer, Gilbert. Electroerosion method and apparatus for machining undercut channels in a workpiece. 4,100,388, Cl. 219-69.00M.
Meyer, Rolf-Volker; and Dhein, Rolf, to Bayer Aktiengesellschaft. Process for the production of high-impact thermoplastic moulding compositions. 4,100,223, Cl. 260-857.00L.
Meyr, Heinrich: *See—*
Lindsey, William C.; Meyr, Heinrich; and King, Peter C., 4,100,503, Cl. 331-1.00A.
Michne, William F., to Sterling Drug Inc. 2,6-Methano-3-benzazocines. 4,100,164, Cl. 260-287.00B.
Micklus, Michael J.; and Ou-Yang, David T., to Biosearch Medical Products, Inc. Coated substrate having a low coefficient of friction hydrophilic coating and a method of making the same. 4,100,309, Cl. 427-2.000.
Microdot Inc.: *See—*
DeLano, Don L., 4,099,820, Cl. 339-88.00R.
Midnight Ears, Inc.: *See—*
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Mie, Terumi: *See—*
Ichikawa, Kunihiro; Mie, Terumi; and Ona, Isao, 4,100,124, Cl. 260-29.20M.
Mikami, Yasao: *See—*
Shinozaki, Mamoru; Takahama, Yuichi; Tubaki, Hachiro; Nagasawa, Kazuo; and Mikami, Yasao, 4,099,284, Cl. 15-42.000.
Miki, Masayuki: *See—*
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Milberger, Ernest C., to Standard Oil Company, The. Automatic catalytic screening unit. 4,099,923, Cl. 23-254.00R.
Miles Laboratories, Inc.: *See—*
Buckler, Robert Thomas, 4,100,185, Cl. 260-465.00F.
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Kluender, Harold Clinton, 4,100,356, Cl. 560-121.000.
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Miles, Larry L., to Texas Instruments Incorporated. Data display system for electronic calculator or microprocessor. 4,100,600, Cl. 364-710.000.
Miller, Gordon H., to Texaco Inc. Polymerization of aliphatic nitriles. 4,100,147, Cl. 528-362.000.
Miller, Grigory Grigorievich: *See—*
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Miller, Harry B., to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft. Winder for yarn and the like. 4,099,680, Cl. 242-18.00A.
Miller, Ralph, to Ciba-Geigy Corporation. Process for preparing cyanogen chloride and gaseous chlorine. 4,100,263, Cl. 423-383.000.
Millheiser, Melvin; and Berliner, Wallace H., to Waldes Kohinoor, Inc. Radially assembled friction-grip self-locking rings. 4,099,444, Cl. 85-8.800.
Milligan, Jimmy L.: *See—*
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Mimura, Yoshiyuki: *See—*
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Mindick, Morris: *See—*
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Mine Safety Appliances Company: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
Bittner, John E.; and Dodsworth, Robert S., 4,099,816, Cl. 339-17.0CF.
Cook, Jack E.; and Bailey, Terry R., 4,099,838, Cl. 350-105.000.
Oliveira, Robert J., 4,099,874, Cl. 356-102.000.
Oliveira, Robert J., 4,099,886, Cl. 356-244.000.
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Mirabel, Bernard: *See—*
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Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.
Mita Industrial Co. Ltd.: *See—*
Takayama, Hiroshi; and Aizawa, Tatsuo, 4,100,087, Cl. 252-62.10P.
Mitchell, Robert Lynn. Battery terminal cleaner. 4,099,310, Cl. 29-79.000.
Mits-Co Geophysics Ltd.: *See—*
Yamashita, Mitsura; Hirano, Kousaku; and Thai, Nguyen Dang, 4,100,482, Cl. 324-6.000.
Mitsubishi Chemical Industries Limited: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,100,299, Cl. 424-330.000.
Sato, Yuzuru; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenji; and Oya, Tadanori, 4,099,972, Cl. 96-29.00D.
Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Uchida, Shoji; Takeshita, Hiroshi; and Yamazaki, Shozo, 4,100,072, Cl. 210-242.00S.
Mitsui Kinzoku Engineering Service Co., Ltd.: *See—*
Murakami, Yoshio; and Nakazawa, Takezo, 4,099,890, Cl. 415-170.00A.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Murakami, Yoshio; and Nakazawa, Takezo, 4,099,890, Cl. 415-170.00A.
Mitsui Polychemicals, Co., Ltd.: *See—*
Tatsumi, Tetsujiro; Miyamoto, Reiji; Narasaki, Shiro; Kazama, Seiji; and Tanaka, Michio, 4,099,638, Cl. 215-12.00R.
Mitter & Co.: *See—*
Mitter, Mathias, 4,099,461, Cl. 101-119.000.
Mitter, Mathias, to Mitter & Co. Control device for controlling the level of a liquid in a container. 4,099,461, Cl. 101-119.000.
Miura, Kiyoshi; and Tomita, Yoshifumi, to Hitachi, Ltd. Photo-sensitive bis-azide containing composition. 4,099,973, Cl. 96-115.00R.

Miyakawa, Nobuaki; and Miki, Masayuki, to Hitachi, Ltd. Multiplication circuit with field effect transistor (FET). 4,100,432, Cl. 307-229.000.
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Tatsumi, Tetsujiro; Miyamoto, Reiji; Narasaki, Shiro; Kazama, Seiji; and Tanaka, Michio, 4,099,638, Cl. 215-12.00R.
Mizelle, Ned W., to Hoover Ball and Bearing Company. Chair control with tilt lock. 4,099,775, Cl. 297-303.000.
Mizukura, Noboru: *See—*
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Mobil Oil Corporation: *See—*
Chen, Nai Y., 4,100,215, Cl. 260-671.00M.
Chen, Nai Yuen; and Haag, Werner O., 4,100,218, Cl. 260-673.000.
Dwyer, Francis G., 4,100,214, Cl. 260-668.00A.
Gournay, Luke S., 4,100,481, Cl. 324-4.000.
Jones, John P., Jr., 4,099,332, Cl. 33-126.70R.
McCarty, William H., 4,100,047, Cl. 204-159.230.
Murphy, William R.; and Rowe, Carleton N., 4,100,083, Cl. 252-34.000.
Pelrine, Bruce Patrick, 4,100,262, Cl. 423-329.000.
Rodewald, Paul G., 4,100,213, Cl. 260-666.00P.
Rodewald, Paul G., 4,100,219, Cl. 260-682.000.
Wardwell, John Albert; Stewert, Ray Alan; and Chow, Ralph Gee, 4,099,643, Cl. 220-222.000.
Young, Lewis Brewster, 4,100,217, Cl. 260-671.00R.
Mobley, Joseph Graham, to Scientific-Atlanta, Inc. Satellite tracking antenna system. 4,100,472, Cl. 318-685.000.
Mochizuki, Yoshifumi; and Morokawa, Shigeru, to Citizen Watch Co., Ltd. Electronic optical display alarm timepiece. 4,099,371, Cl. 58-22.700.
Molins, Desmond Walter, to Molins Limited. Receptacle emptying device for elongated cylindrical elements. 4,099,637, Cl. 214-306.000.
Molins Limited: *See—*
Molins, Desmond Walter, 4,099,637, Cl. 214-306.000.
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Mong, William K.; and Zoric, Michael T., to Westinghouse Air Brake Company. Vented ball type angle cock. 4,099,543, Cl. 137-625.220.
Monrolin, Jean Louis, to International Business Machines Corporation. Carrier synchronization system for coherent phase demodulators. 4,100,499, Cl. 329-50.000.
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Hobbs, Charles F.; and McMackins, Dudley E., 4,100,194, Cl. 260-576.000.
Hobbs, Charles F.; and McMackins, Dudley E., 4,100,196, Cl. 260-585.00D.
Lannert, Kent P., 4,100,358, Cl. 560-180.000.
Moore, Bruce H., to Samuel Moore and Company. Method of making push-pull cable conduit and product. 4,099,425, Cl. 74-501.00P.
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Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,557, Cl. 165-104.00S.
Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,558, Cl. 165-104.00S.
Morain, Eldon W.: *See—*
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Morgan, Joe Pierce; Phillips, Howard Charles; and Spong, Richard Vernon, to AMP Incorporated. Apparatus for inserting displation type terminals into cavities. 4,099,316, Cl. 29-566.200.
Mori, Eizo; and Mori, Takao. Garden shears. 4,099,326, Cl. 30-135.000.
Mori, Haruo, to Fuji Jukogyo Kabushiki Kaisha. Internal combustion engine having exhaust emission control system. 4,099,497, Cl. 123-117.00A.
Mori, Mamoru; Yasumatsu, Jun; and Kubota, Tatsushi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and K. K. Tokai Rika Denki Seisakusho. Seat belt system. 4,099,684, Cl. 242-107.000.
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Morimoto, Yuko: *See—*
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Morinaga Milk Industry Co., Ltd.: *See—*
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Morio, Minoru; and Kambara, Masahiro, to Sony Corporation. Method of and apparatus for modifying a video signal to prevent unauthorized recording and reproduction thereof. 4,100,575, Cl. 358-120.000.
Morishita, Hirosada; Kawamoto, Mineo; Wajima, Motoyo; and Murakami, Kanji, to Hitachi, Ltd. Electroless copper solution. 4,099,974, Cl. 106-1.230.
Morisi, Franco: *See—*
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Mochizuki, Yoshifumi; and Morokawa, Shigeru, 4,099,371, Cl. 58-22.700.
Morozowich, Walter, to Upjohn Company, The. Inter-phenylene-PG amides. 4,100,192, Cl. 260-558.00R.
Morphy, Paul H., to Hobart Corporation. Insulated cabinet and method of construction. 4,099,812, Cl. 312-214.000.
Morris, John C.; Weidman, James K.; and Prior, Michael D., to Riverside Clay Company. Apparatus for applying granular refractory material to surfaces. 4,099,708, Cl. 266-281.000.
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Mortensen, Donald G.; and Strand, Dennis P., to FMC Corporation. Impulse filter cleaner. 4,099,940, Cl. 55-300.000.
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Moss, Maurice; Hill, Colin Barry; and Rowland, Michael Roger, to Securicum S.A. Method of making carbon fibers and resin-impregnated carbon fibers. 4,100,004, Cl. 156-60.000.
Motoren- und Turbinen-Union Munchen GmbH: *See—*
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Stipanuk, James Jacob, 4,100,431, Cl. 307-213.000.
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Ashman, John Slocum; Burt, Gerald Dennis; and Mudrak, Anton, 4,100,076, Cl. 252-8.100.
Burt, Gerald Dennis; and Mudrak, Anton, 4,100,077, Cl. 252-8.100.
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Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,027, Cl. 195-51.00G.
Mui, Jeffrey Y. P.; and Kanner, Bernard, to Union Carbide Corporation. Sulfur containing norbornanyl silicon compounds. 4,100,172, Cl. 260-327.00H.
Mui, Jeffrey Yick-Pui; and Pines, Arthur Noah, to Union Carbide Corporation. Sulfur containing silane coupling agents. 4,099,981, Cl. 106-308.00Q.
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Muller, Hermann; and Schaaber, Otto. Process for producing an extremely hard mixed carbide layer on ferrous materials to increase their resistance to wear. 4,099,993, Cl. 148-14.000.
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Muller, Paul, to Ciba-Geigy Corporation. Chlorine-containing disaza pigments. 4,100,156, Cl. 260-174.000.
Muller, Paul; and Muller, Willy, to Ciba-Geigy Corporation. β-Crystalline form of the pigment obtained by coupling diazotized 1-aminobenzene-2-carboxylic acid methyl ester with 2,3-oxynaphthoic acid. 4,100,157, Cl. 260-174.000.
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Mullin, Joseph V.; and Sauer, W. Edwin, to Proctor & Schwartz, Inc. Solar assisted dryer apparatus and method. 4,099,338, Cl. 34-35.000.
Mullins, Max. Compatible sprocket and chain system. 4,099,423, Cl. 74-243.00R.
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Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,099,369, Cl. 56-314.000.
Munding, German: *See—*
Singelmann, Dietrich; Strobl, Heinrich; and Munding, German, 4,099,445, Cl. 89-7.000.
Munktell, Hans Gosta: *See—*
Andren, Lars-Goran Hjalmar; Bjorkman, Rune Harald; Easterday, Richard Lee; and Munktell, Hans Gosta, 4,099,882, Cl. 356-181.000.
Mura, Lawrence A.: *See—*
Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., 4,100,231, Cl. 260-978.000.
Murai, Hiromu; and Aoyagi, Yoshiaki, to Nippon Shinyaku Co., Ltd.

N-substituted trialkoxybenzyl piperazine derivatives. 4,100,285, Cl. 424-250.000.

Murakami, Kanji: *See*—
Morishita, Hirosada; Kawamoto, Mineo; Wajima, Motoyo; and Murakami, Kanji, 4,099,974, Cl. 106-1.230.

Murakami, Yoshio; and Nakazawa, Takezo, to Mitsui Mining & Smelting Co., Ltd.; and Mitsui Kinzoku Engineering Service Co., Ltd. Impeller type pump having seal means and protective means. 4,099,890, Cl. 415-170.00A.

Murphy, William R.; and Rowe, Carleton N., to Mobil Oil Corporation. Lubricant compositions containing an amine salt of a half ester of succinic acid. 4,100,083, Cl. 252-34.000.

Muth, Hans-Albrecht; Reissig, Dirk; and Marwitz, Hans-Gunther v.d., to Bayerische Motoren Werke Aktiengesellschaft. Fuel tank, especially for motorcycles. 4,099,645, Cl. 220-304.000.

Muto, Hakaru; Kurabayashi, Sadasuke; Takatori, Yasushi; Yamaguchi, Isao; and Watanabe, Asao, to Canon Kabushiki Kaisha. Recording apparatus for a voltage sensitive recording system. 4,100,552, Cl. 346-162.000.

Muto, Teruhide, to Shinko Industries Co., Ltd.; and Toyonaka Kosakusho Co., Ltd. Apparatus for providing adhesive strips of predetermined length. 4,099,433, Cl. 83-155.000.

MWA Company: *See*—
Hasty, Jerry N., 4,099,350, Cl. 51-338.000.

Myer, Floyd L.: *See*—
Smith, Kenneth E.; and Myer, Floyd L., 4,099,594, Cl. 180-14.00B.

Myers, Donald L.: *See*—
Medler, Albert S.; and Myers, Donald L., 4,100,013, Cl. 156-441.000.

Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, to Sun Oil Company of Pennsylvania. Preparation of beta-methyltetramethylene nortricyclane. 4,100,216, Cl. 260-666.0PY.

Myers, Harry K., Jr.: *See*—
Suld, George; Schneider, Abraham; and Myers, Harry K., Jr., 4,100,338, Cl. 526-142.000.

N.B.F. Company, Inc.: *See*—
Foley, Newman Clarence, 4,099,739, Cl. 280-504.000.

Naaijer, Geert Jan: *See*—
Durand, Henri; and Naaijer, Geert Jan, 4,100,427, Cl. 307-87.000.

Nablo, Samuel V.; and Fussa, Alfred D., to Energy Sciences Inc. Process for curing of adhesives for flocking and texturing on heat-sensitive substrates, by electron-beam radiation. 4,100,311, Cl. 427-44.000.

Nagasawa, Kazuo: *See*—
Shinozaki, Mamoru; Takahama, Yuichi; Tubaki, Hachiro; Nagasawa, Kazuo; and Mikami, Yasao, 4,099,284, Cl. 15-42.000.

Nagase, Hidenobu; Kishida, Eiji; and Yoshihara, Mitsuji, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor heat shield. 4,099,496, Cl. 123-41.310.

Nagata, Kazuhiro: *See*—
Ogasa, Katsuhiro; Kuboyama, Morio; Saito, Minoru; and Nagata, Kazuhiro, 4,100,022, Cl. 195-1.800.

Nagawa, Yuji: *See*—
Fujino, Masahiko; Nishimura, Osamu; Nagawa, Yuji; and Fukuda, Naohisa, 4,100,152, Cl. 260-112.5TR.

Nagel, Hartmut: *See*—
Menth, Anton; Nagel, Hartmut; and Perry, Antony James, 4,099,995, Cl. 148-101.000.

Naka, Reishi; Narahara, Toshikazu; and Mukai, Junji, to Hitachi, Ltd. Polyurethane foam composition. 4,100,114, Cl. 521-175.000.

Nakada, Akira: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,099,438, Cl. 84-1.250.

Nakagaki, Harushige; Sampei, Tohru; Amada, Nobutaka; and Baba, Tatsuo, to Hitachi, Ltd. Audio frequency power amplifier. 4,100,501, Cl. 330-263.000.

Nakaisumi, Yasushi: *See*—
Okumura, Masahide; Sakitani, Yoshio; Nakaisumi, Yasushi; and Nakata, Toshiaki, 4,099,704, Cl. 251-134.000.

Nakajima, Hiromu, to Kabushiki-Kaisha Nakajima. Method and apparatus for producing welded steel tubes having large square cross section. 4,099,662, Cl. 228-151.000.

Nakajima, Shigeo; and Endo, Hajime, to Taiheiyo Engineering Incorporated. Apparatus for drawing the shearers. 4,099,786, Cl. 299-43.000.

Nakajima, Takayoshi; Sonoda, Hiroshi; Sasaki, Katsutoshi; and Hane, Teruaki, to Chisso Corportion. Method of and apparatus for producing hollow-cylindrically shaped fibrous articles. 4,100,009, Cl. 156-184.000.

Nakamura, Zenzo; Ohtaki, Syohei; Tsunekawa, Tokuichi; Ito, Tadashi; Aizawa, Hiroshi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Indicator circuit for electronic flash apparatus. 4,100,459, Cl. 315-136.000.

Nakano, Soichi; Ohama, Yasumichi; and Watanabe, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust system for internal combustion engine. 4,099,500, Cl. 123-122.0AB.

Nakata, Toshiaki: *See*—
Okumura, Masahide; Sakitani, Yoshio; Nakaisumi, Yasushi; and Nakata, Toshiaki, 4,099,704, Cl. 251-134.000.
Ueno, Yukichi; and Nakata, Toshiaki, 4,100,410, Cl. 250-311.000.

Nakatsubo, Toshio; and Nishikawa, Masaji, to Olympus Optical Co., Ltd. Improved electrographic process for producing a plurality of copies. 4,099,863, Cl. 355-3.0SC.

Nakazawa, Takezo: *See*—
Murakami, Yoshio; and Nakazawa, Takezo, 4,099,890, Cl. 415-170.00A.

Nalco Chemical Company: *See*—
Selvarajan, Radhakrishnan; and Ballweber, Edward G., 4,100,167, Cl. 260-296.00R.
Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., 4,100,231, Cl. 260-978.000.
Vossos, Peter H.; Mindick, Morris; and Koskan, Larry P., 4,100,258, Cl. 423-242.000.

Nally, Robert B., to NCR Canada Ltd. - NCR Canada LTEE. Method and apparatus for determining velocity of a moving member. 4,100,599, Cl. 364-565.000.

Namba, Keisuke: *See*—
Tabata, Norikazu; Ueno, Takanori; and Namba, Keisuke, 4,100,421, Cl. 250-533.000.

Napco Security Systems, Inc.: *See*—
Stockdale, Roy; and Weston, Lance, 4,100,543, Cl. 340-521.000.

Napolitano, Orlando; Reid, Robert Edward; Saltzberg, Burton R.; Stochel, Nathan Harold; and Tingley, John Ronald, to Bell Telephone Laboratories, Incorporated. Multipoint polling technique. 4,100,533, Cl. 340-147.00R.

Narahara, Toshikazu: *See*—
Naka, Reishi; Narahara, Toshikazu; and Mukai, Junji, 4,100,114, Cl. 521-175.000.

Narasaki, Shiro: *See*—
Tatsumi, Tetsujiro; Miyamoto, Reiji; Narasaki, Shiro; Kazama, Seiji; and Tanaka, Michio, 4,099,638, Cl. 215-12.00R.

Nardi, John C.: *See*—
Hussey, Charles L.; Nardi, John C.; Fannin, Armand A., Jr.; King, Lowell A.; and Erbacher, John K., 4,100,044, Cl. 204-146.000.

Narita, Kinichiro: *See*—
Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,100,454, Cl. 313-495.000.

Narita, Yoshihiro: *See*—
Takano, Hideo; Saito, Satoshi; Sato, Tadashi; Yamaguchi, Tuyoshi; and Narita, Yoshihiro, 4,099,897, Cl. 425-4.00C.

Narui, Hiroshi; Akune, Ikuo; and Kobiki, Yosiya, to Oike & Co., Ltd. Metal leaf. 4,100,317, Cl. 428-137.000.

Narumi China Corp.: *See*—
Kobayakawa, Masaki; Yawata, Kazufumi; Ohta, Kazuo; and Kumazawa, Koichi, 4,100,456, Cl. 313-497.000.

Naruse, Yohsuke; and Sugiki, Mikio, to Sony Corporation. Apparatus for optically reading signal information recorded on a reflective record medium surface. 4,100,577, Cl. 358-128.000.

Nash, Myrwin William; Barry, John Kenneth; and Wiatt, James Gordon, to Cincinnati Milacron Inc. Injection molding machine base. 4,099,905, Cl. 425-589.000.

Nash, Paul. Optical inspection systems. 4,099,884, Cl. 356-200.000.

National Distillers and Chemical Corp.: *See*—
McClain, Dorothee M.; and Vest, Betty L., 4,100,335, Cl. 526-10.000.

National Petro Chemicals Corporation: *See*—
Katzen, Stanley J.; and Rekers, Louis J., 4,100,104, Cl. 252-428.000.

National Research Development Corporation: *See*—
Lawrenson, Peter John; and Hughes, Austin, 4,100,473, Cl. 318-696.000.
Woolvet, George Albert; and Tolley, Bryan Peter, 4,099,411, Cl. 73-141.00R.

National Semiconductor Corporation: *See*—
Schultz, James Edward; and Burns, Carmen D., 4,099,660, Cl. 228-13.000.

Natural Resources Guardianship International, Inc.: *See*—
Webb, Harry Matthew, 4,099,930, Cl. 44-56.000.

NB Jackets Company: *See*—
Dorman, Isidore, 4,099,362, Cl. 53-123.000.

NCR Canada Ltd. - NCR Canada LTEE: *See*—
Nally, Robert B., 4,100,599, Cl. 364-565.000.

NCR Corporation: *See*—
Foris, Peter L.; Brown, Robert W.; and Phillips, Paul S., Jr., 4,100,103, Cl. 252-316.000.

Nebash, Stanley P.: *See*—
Vancheri, Frank J.; Nebash, Stanley P.; and McConnaughey, Paul W., 4,099,939, Cl. 55-246.000.

Nedelec, Lucien; Frechet, Daniel; Dumont, Claude; and Kannengiesser, Marie-Helene, to Roussel Uclaf. Novel benzazepines. 4,100,278, Cl. 424-244.000.

Neff, James A., to MAC Valves, Inc. Alignment means for a moveable pole-plunger assembly. 4,100,519, Cl. 335-262.000.

Nehrbass, John. Method of measuring the instantaneous flow rate of urine discharge. 4,099,412, Cl. 73-209.000.

Neil, Clyde Carl: *See*—
Hammer, Jacob Meyer; and Neil, Clyde Carl, 4,100,313, Cl. 427-162.000.

Neithardt, William A., Jr., to Keuffel & Esser Company. Drafting film. 4,100,329, Cl. 428-413.000.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-cis-4,5-didehydro-9-deoxy-PGD_2 compounds. 4,100,198, Cl. 260-586.00R.

Nelson, Paul M., to Wilson Industries, Inc. Overshot cutter with flexible release cage. 4,099,561, Cl. 166-55.100.

Nelson, Peter H.; and Untch, Karl G., to Syntex (U.S.A.) Inc. Process for the preparation of 2-(5H-dibenzo[a,d]cyclohepten-5-on-2-yl)acetic, propionic and butyric acids and intermediates. 4,100,174, Cl. 260-340.90R.

Nelson, Terrance D.; and Klippel, Bruce G., to Allen-Bradley Company. Hybrid motor starter. 4,100,469, Cl. 318-227.000.

Nergard, Orv, to Dart Industries, Inc. Drinking receptacle cover and valve assembly. 4,099,642, Cl. 220-90.400.

Nessfield, Stanley; Foster, John Elliott; and Clive-Smith, Martin, to Sea Containers, Ltd. Collapsible containers. 4,099,640, Cl. 220-6.000.

Nestor Engineering Associates, Inc.: *See*—
Nestor, Jack; and Slepyan, David H., 4,099,521, Cl. 128-020.000.

Nestor, Jack; and Slepyan, David H., to Nestor Engineering Associates, Inc. Surgical retractor adjustable mounting apparatus. 4,099,521, Cl. 128-020.000.

Netherwood, Paul H.: *See*—
Peck, David B.; Guntlow, Vincent T.; and Netherwood, Paul H., 4,100,490, Cl. 324-182.000.

Netzel, Philip C., to Electric Power Research Institute. Latch structure for insulator spacer. 4,100,367, Cl. 174-28.000.

Neugroschel, Eric: *See*—
Stiel, Donald Melvyn; Browski, Charles Robert; Neugroschel, Eric; and Williams, Joseph James, 4,100,598, Cl. 364-476.000.

Neumann, Henning; Schalausky, Horst; and Britschinn, Horst, to Metzeler Kautschuk AG. Multi-purpose carrying bag or case. 4,099,656, Cl. 224-5.00W.

Neuroth, Norbert: *See*—
Faulstich, Marga; Neuroth, Norbert; Reitmayer, Franz; and Krolla, Georg, 4,099,834, Cl. 350-96.340.

New Colony Inventions, Inc.: *See*—
Antolino, Angelo, 4,099,654, Cl. 222-184.000.

New Life Foundation: *See*—
Mackenzie, Harold B.; and Anderson, Ingvar G., 4,099,473, Cl. 110-219.000.

Newall Engineering Company Ltd., The: *See*—
Rogers, Michael James, 4,100,485, Cl. 324-208.000.

Newman, Francis Marion, Jr.; and Silvus, H. Stanley, Jr., to Southwest Research Institute. Automatic self-cleaning ferromagnetic metal detector. 4,100,491, Cl. 324-204.000.

Nicholas, William: *See*—
Billington, Evans R.; and Nicholas, William, 4,099,551, Cl. 141-388.000.

Nicholls, Keith David: *See*—
den Brinker, Carl S.; and Nicholls, Keith David, 4,100,530, Cl. 340-53.000.

Nickell, Louis G., to W. R. Grace & Co. Ripening of sugarcane by use of alcohols. 4,099,957, Cl. 71-122.000.

Niemi, Ilmer Issac: *See*—
Hudler, Charles William; Swanson, Clare Eugene; Sundin, George Holger; and Niemi, Ilmer Issac, 4,099,619, Cl. 206-524.100.

Nihon Technical Kabushiki Kaisha: *See*—
Ohashi, Tamaki; Shosakai, Shigemasa; Yamagishi, Shohei; and Taniguchi, Kunihiro, 4,099,421, Cl. 74-10.330.

Niki, Masao: *See*—
Fukusaki, Hiroshi; Niki, Masao; and Yokota, Yukinaga, 4,100,127, Cl. 260-29.6NR.

Niklas, Ludwig, to Krautkramer-Branson, Incorporated. Resolution real-time ultrasonic imaging apparatus. 4,099,416, Cl. 73-602.000.

Nippon Air Brake Co., Ltd., The: *See*—
Inoue, Hiroo; and Kishimoto, Isao, 4,099,476, Cl. 114-144.00R.

Nippon Chemical Industrial Co., Ltd.: *See*—
Abe, Nobuyoshi; Kubo, Shigenaga; and Kanamaru, Kiyoshi, 4,100,074, Cl. 252-8.100.

Nippon Electric Co., Ltd.: *See*—
Hada, Hiroshi; and Hirayama, Tsutomu, 4,100,461, Cl. 315-169.0TV.
Takahashi, Akinori, 4,100,407, Cl. 250-214.00P.

Nippon Electric Kagoshima, Ltd.: *See*—
Kobayakawa, Masaki; Yawata, Kazufumi; Ohta, Kazuo; and Kumazawa, Koichi, 4,100,456, Cl. 313-497.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,099,438, Cl. 84-1.250.
Yokoyama, Kenji, 4,100,438, Cl. 307-304.000.

Nippon Kogaku K.K.: *See*—
Kaneko, Masanobu, 4,099,842, Cl. 350-175.00E.
Matsui, Sei, 4,099,850, Cl. 350-215.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Tanaka, Jinkichi; Watanabe, Itaru; and Suzuki, Motoaki, 4,100,389, Cl. 219-74.000.

Nippon Oil Company, Ltd.: *See*—
Shinomura, Toshihiko, 4,100,238, Cl. 264-49.000.

Nippon Shinyaku Co., Ltd.: *See*—
Murai, Hiromu; and Aoyagi, Yoshiaki, 4,100,285, Cl. 424-250.000.

Nippon Soken, Inc.: *See*—
Yasuda, Eturo; Sato, Susumu; Segawa, Yoshihiro; Hattori, Tadashi; and Aoki, Keiji, 4,099,922, Cl. 23-254.00E.

Nischk, Gunther: *See*—
Wolf, Gerhard Dieter; Schnoor, Werner; Voegele, Jean-Claude; Reinehr, Ulrich; and Nischk, Gunther, 4,100,143, Cl. 526-301.000.

Nisdorf Computer AG: *See*—
Pollmeier, Werner, 4,100,595, Cl. 363-133.000.

Nishikawa, Masaji: *See*—
Nakatsubo, Toshio; and Nishikawa, Masaji, 4,099,863, Cl. 355-3.0SC.

Nishimura, Osamu: *See*—
Fujino, Masahiko; Nishimura, Osamu; Nagawa, Yuji; and Fukuda, Naohisa, 4,100,152, Cl. 260-112.5TR.

Nishimura, Yoshitaka: *See*—
Orimoto, Koji; Uno, Masataka; Oomachi, Yoshio; and Nishimura, Yoshitaka, 4,099,449, Cl. 91-358.00A.

Nishioka, Matsuo, to Matsushita Electric Industrial Co., Ltd. Pushbutton switch unit with reversible spring. 4,100,384, Cl. 200-160.000.

Nisper, Kenneth J., to Questor Corporation. Piston ring construction. 4,099,730, Cl. 277-139.000.

Nissan Motor Company, Limited: *See*—
Yoshimura, Tooru; and Kuroda, Hiroshi, 4,099,377, Cl. 60-276.000.

Nist, Ferdinand J., Jr., to Seattle Box Co. Shipping bundle for numerous pipe lengths. 4,099,617, Cl. 206-443.000.

Nitto Kogaku Kabushiki Kaisha: *See*—
Ito, Yukio, 4,099,847, Cl. 350-187.000.

Niveau AG, Firma: *See*—
Halm, Hans, 4,100,060, Cl. 209-80.500.

Nobutoki, Saburo; and Okano, Yukio, to Hitachi, Ltd.; and Minolta Camera Co., Ltd. Optical image pickup system. 4,100,570, Cl. 358-44.000.

Nogami, Tomoyuki; and Ohta, Takaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic brake pressure control apparatus for vehicles. 4,099,791, Cl. 303-24.00F.

Noguchi, Yoshikazu; Senda, Katsuyuki; and Kobashi, Mamoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition system. 4,099,508, Cl. 123-148.0DC.

Noller, David Lewis. Telephone, intercom and remote control system. 4,100,375, Cl. 179-2.00A.

Nomura, Masayoshi: *See*—
Ura, Mitsuru; Ogawa, Takuzo; Suzuki, Takaya; Inoue, Yosuke; and Nomura, Masayoshi, 4,100,310, Cl. 427-8.000.

Non, Tse Quong. Passive restraint system with head and knee restraint. 4,099,743, Cl. 280-753.000.

Nonaka, Hidehiro, to Japan Steel Works LTD. Method for directly cooling melted thermoplastic resins. 4,100,244, Cl. 264-211.000.

Noonan, Joseph. Heat-conserving cooking utensil. 4,099,512, Cl. 126-246.000.

Norback, Per S., to Aktiebolaget Carl Munters. Method of manufacturing a heat exchanger body for recuperative exchangers. 4,099,928, Cl. 29-157.30D.

Nordson Corporation: *See*—
Scholl, Charles H.; and Reighard, Alan B., 4,099,653, Cl. 222-146.0HE.

Norlin Music, Inc.: *See*—
Luce, David A., 4,099,439, Cl. 84-1.260.

Norris, Alan Hedley; Cromer, Edwin Dwain; and Chambley, Phillip Wayne, to Champion International Corporation. Space print head draw rolls. 4,099,393, Cl. 68-22.00R.

North, Robert Jarl, to Harmon Colors Corporation. Process for producing gamma quinacridone solid solutions. 4,099,980, Cl. 106-288.00Q.

North, Robert Jarl, to Harmon Colors. Process for preparing gamma quinacridone from polyphosphoric acid and alcohol. 4,100,162, Cl. 260-279.0QA.

Northern Telecom Limited: *See*—
Woytiuk, Leo Victor; Mayer, Ronald Yves; and Kepes, George B., 4,100,002, Cl. 156-48.000.

Noshay, Allen; and Karol, Frederick John, to Union Carbide Corporation. Olefin polymerization process and catalyst therefor. 4,100,337, Cl. 526-130.000.

Noury, Jerry L., Jr.: *See*—
Stavrou, Paul Constantine; and Slack, William Frederick, 4,099,437, Cl. 84-1.010.

Nouvertne, Werner: *See*—
Freitag, Dieter; and Nouvertne, Werner, 4,100,130, Cl. 260-37.0PC.

Novo Industri A/S: *See*—
Adler-Nissen, Jens Lorenz, 4,100,024, Cl. 195-29.000.
Adler-Nissen, Jens Lorenz, 4,100,151, Cl. 260-112.00G.

Numata, Shun-ichi; Yokono, Hitoshi; and Mukai, Junji, to Hitachi, Ltd. Thermosetting resin composition. 4,100,118, Cl. 260-18.0PT.

Nuovo Pignone S.p.A.: *See*—
Santucci, Nicola, 4,099,546, Cl. 139-27.000.

Nuttall, Wayne E.; and Page, William H., to United States Steel Corporation. Low emission multiple sealing system for floating roof tanks. 4,099,644, Cl. 220-225.000.

Nyberg, David Dolph: *See*—
Cammack, Travers Kregg, II; and Nyberg, David Dolph, 4,100,089, Cl. 252-63.000.

Nyi, Kayson: *See*—
Emmons, William D.; Sperry, Peter R.; and Nyi, Kayson, 4,100,133, Cl. 260-45.90L.

Nylykke, Hans Peter Glud, to Danfoss A/S. Stuffing box backstop ring. 4,099,729, Cl. 277-96.100.

Oakley, Ervin Carvis; Bell, George Robert; and Poole, William Eugene, to ECO Industries, Inc. Upright vault-like steel cabinet for guns and valuables. 4,099,808, Cl. 312-138.00R.

Oberloier, William, to Lyle Development, Inc. Thermoforming machine. 4,099,902, Cl. 425-388.000.

Oetjen, Heinrich: *See*—
Gutermuth, Paul; Oetjen, Heinrich; and Gutermuth, Paul, Jr., 4,099,941, Cl. 55-269.000.

Offer, Robert: *See*—
Fischman, Kurt; Offer, Robert; Rudner, Bernard; and Shepard, David, 4,099,943, Cl. 55-487.000.

Office National d'Etudes et de Recherches Aerospatiales: *See*—
Valdois, Michel M.; and Dupuy, Armand B., 4,100,512, Cl. 331-158.000.

Ogasa, Katsuhiro; Kuboyama, Morio; Saito, Minoru; and Nagata, Kazuhiro, to Morinaga Milk Industry Co., Ltd. Process for preparing a curing agent for myelogenic leukemia. 4,100,022, Cl. 195-1.800.

Ogata, Fumio: *See*—
Iyotani, Ryuji; Watanabe, Atsumi; Amano, Hisao; and Ogata, Fumio, 4,100,434, Cl. 307-252.00L.

Ogawa, Takuzo: *See*—
Ura, Mitsuru; Ogawa, Takuzo; Suzuki, Takaya; Inoue, Yosuke; and Nomura, Masayoshi, 4,100,310, Cl. 427-8.000.
Ogawa, Toshio: *See*—
Kuroda, Masao; Kondo, Toshio; Ogawa, Toshio; and Ono, Sekijyuro, 4,099,419, Cl. 73-626.000.
Ogles, Ethridge F., to Ada Pumps, Inc. Hydraulically operated oil well pump jack. 4,099,447, Cl. 91-218.000.
Ohama, Yasumichi: *See*—
Nakano, Soichi; Ohama, Yasumichi; and Watanabe, Masao, 4,099,500, Cl. 123-122.0AB.
Okura, Takao; Hashimoto, Eiichi; and Ohama, Yasumichi, 4,099,502, Cl. 123-122.0AC.
O'Hara, Sydney: *See*—
Cooper, Kenneth; Groves, Ian Stanley; Leigh, Peter Alexander; McIntyre, Neil; O'Hara, Sydney; and Speight, John Donald, 4,099,318, Cl. 29-578.000.
Oharek, Frank J.: *See*—
Dykes, Wiley V.; and Oharek, Frank J., 4,100,571, Cl. 358-87.000.
Ohashi, Tamaki; Shosakai, Shigemasa; Yamagishi, Shohei; and Taniguchi, Kunihiro, to Nihon Technical Kabushiki Kaisha. Pushbutton tuner. 4,099,421, Cl. 74-10.330.
Ohno, Yukihiro, to Ricoh Co., Ltd. Pressure fixing apparatus for electrophotography. 4,099,484, Cl. 118-117.000.
Ohsawa, Mitsuo; Onoe, Yukio; and Yamagishi, Hiroshi, to Sony Corporation. Angle-modulation detector having push-pull input applied through high-pass filters. 4,100,500, Cl. 329-103.000.
Ohsawa, Shiuji. Apparatus for detecting break or slackening of yarn. 4,100,425, Cl. 250-561.000.
Ohta, Kazuo: *See*—
Kobayakawa, Masaki; Yawata, Kazufumi; Ohta, Kazuo; and Kumazawa, Koichi, 4,100,456, Cl. 313-497.000.
Ohta, Takaaki: *See*—
Nogami, Tomoyuki; and Ohta, Takaaki, 4,099,791, Cl. 303-24.00F.
Ohtaki, Syohei: *See*—
Nakamura, Zenzo; Ohtaki, Syohei; Tsunekawa, Tokuichi; Ito, Tadashi; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,100,459, Cl. 315-136.000.
Ohte, Akira; and Imamura, Makoto, to Yokogawa Electric Works, Ltd. Thermal noise thermometer. 4,099,413, Cl. 73-359.00R.
Oike & Co., Ltd.: *See*—
Narui, Hiroshi; Akune, Ikuo; and Kobiki, Yosiya, 4,100,317, Cl. 428-137.000.
Oiles Kogyo Kabushiki Kaisha: *See*—
Horikawa, Masayuki; Takata, Yataro; and Sumiyoshi, Kikuo, 4,100,245, Cl. 264-211.000.
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Okumura, Masahide; Sakitani, Yoshio; Nakaisumi, Yasushi; and Nakata, Toshiaki, to Hitachi, Ltd. Vacuum valve apparatus. 4,099,704, Cl. 251-134.000.
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Olds, Leonard Elmo, to Johns-Manville Corporation. Method of reducing deterioration of electric furnace refractory metal components. 4,099,949, Cl. 65-17.000.
Olin Corporation: *See*—
Butt, Sheldon H., 4,099,559, Cl. 165-170.000.
Magan, Phillip R., 4,100,098, Cl. 252-188.000.
Martin, Richard Hugo, 4,100,396, Cl. 219-384.000.
Olivan, Andre J. Truck cab caddy. 4,099,813, Cl. 312-243.000.
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Olympus Optical Co., Ltd.: *See*—
Imai, Toshihiro, 4,099,843, Cl. 350-176.000.
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Onnen, James H., to American Air Filter Company, Inc. Mist eliminator cleaning device. 4,099,938, Cl. 55-230.000.
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Frohlich, Alfons; and Passmann, Walter, 4,099,302, Cl. 24-205.15R.
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Dunks, Gary Burr; and Ordonez, Kathy Palmer, 4,100,199, Cl. 260-606.50B.
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O'Roark, James R., to Hewitt Soap Company, Inc., The. Low pH detergent bar. 4,100,097, Cl. 252-145.000.
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Shaw, Eugene Douglas, 4,100,267, Cl. 424-1.000.
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Anderson, Richard A.; Sokolowski, Robert C.; and Ostermeier, Kurt W., 4,100,324, Cl. 428-288.000.
O'Sullivan, Denis Joseph, to Loctite (Ireland) Limited. Stabilized adhesive and curing compositions. 4,100,141, Cl. 526-301.000.
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Callahan, John A.; and Ottenstein, Allan S., 4,100,400, Cl. 235-92.0FL.
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Micklus, Michael J.; and Ou-Yang, David T., 4,100,309, Cl. 427-2.000.
Outram, Christopher David, to CCL Systems, Ltd. Method and device for joining concrete bodies and method of constructing a multi-story building. 4,099,360, Cl. 52-745.000.
Ovenden, Charles William, to Elliott Brothers (London) Limited. Electric amplifying arrangements. 4,100,464, Cl. 315-397.000.
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Francel, Josef; King, James E.; and Woulbroun, John M., 4,099,977, Cl. 106-53.000.
Franklin, Earl W., 4,100,001, Cl. 106-39.700.
Go, Santos W., 4,100,303, Cl. 426-106.000.
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Oya, Tadanori: *See*—
Sato, Yuzuru; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenji; and Oya, Tadanori, 4,099,972, Cl. 96-29.00D.
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Kourbetsos, John, 4,099,602, Cl. 188-300.000.
Pader, Morton, to Lever Brothers Company. Anticalculus dentifrice. 4,100,269, Cl. 424-49.000.
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Pagel, Ernst-Olav; and Borst, Wolfgang, to Robert Bosch GmbH. Method and system to control the duty cycle of a pulse voltage changing in frequency. 4,099,507, Cl. 123-148.00E.

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Panel Controls Corporation: *See—*
Van Osdol, Peter, 4,099,623, Cl. 211-41.000.

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Sorenson, James L.; Pannier, Karl A., Jr.; and Reynolds, Gordon S., 4,099,528, Cl. 128-214.400.

Papp, Louis S., to Incom International Inc. Two-way bypass valve. 4,099,540, Cl. 137-493.800.

Parad, Leonard I.: *See—*
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Paragi, Edward J.: *See—*
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Parera, Pedro Pere. Snap fastener. 4,099,303, Cl. 24-217.00R.

Parisi, Joseph J. Seat construction. 4,099,278, Cl. 5-361.00B.

Park, W. Sidney. Boat launching and recovery guide for boat trailers. 4,099,279, Cl. 9-1.200.

Parsons, David: *See—*
Temperley, Harry Davison; and Parsons, David, 4,099,600, Cl. 188-73.400.

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van der Wal, Johannes; Gielens, Wilhelmus Adrianus Jacobus; and Pasmans, Johannes Maria Marinus, 4,099,840, Cl. 350-166.000.

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Passmann, Walter: *See—*
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Patel, Jayantilal M.: *See—*
Gregg, Richard; Weikel, James A.; Patel, Jayantilal M.; and Durchholz, Richard F., 4,100,306, Cl. 426-386.000.

Patten, James W., to United States of America, Energy. Closed cell metal foam method. 4,099,961, Cl. 75-20.00F.

Paull, Peter L.; and McGann, Rodney, to Texaco Inc. By-product superheated steam from the partial oxidation process. 4,099,382, Cl. 60-648.000.

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Peak, Steven C.: *See—*
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Peake, Clinton Joseph; Harnish, Wayne Nelson; and Davidson, Bruce Lloyd, to FMC Corporation. Mono-5-substituted-thio-3-chloro-4H-1,2,6-thiadiazin-4-one antifungal agents. 4,100,281, Cl. 424-246.000.

Peck, David B.; Guntlow, Vincent T.; and Netherwood, Paul H., to Diametrics, Inc. Elapsed time indicator and electrolytic timer cell. 4,100,490, Cl. 324-182.000.

Pecoraro, George A., to PPG Industries, Inc. Glass ribbon apparatus with tweel employing glassy silica glass contact refractory. 4,099,950, Cl. 65-99.00A.

Peditto, Andrea; Fossati, Franco; and Petrillo, Vincenzo, to Liquichimica Robassomero S.p.A. Process for the preparation of additives for lubricating oils. 4,100,085, Cl. 252-42.700.

Pedroso, Raul, to Coulter Electronics, Inc. Safety interlock device. 4,100,419, Cl. 250-514.000.

Peek, Johannes Bernhard Heinrich: *See—*
Claasen, Theodoor Antonius Carel Maria; and Peek, Johannes Bernhard Heinrich, 4,100,378, Cl. 179-84.0VF.

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Pelletier, Andre: *See—*
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Pelrine, Bruce Patrick, to Mobil Oil Corporation. Synthesis of zeolite ZSM-5. 4,100,262, Cl. 423-329.000.

Pelz, Lothar: *See—*
Quietzsch, Gerhard; Greiner, Bernd; and Pelz, Lothar, 4,100,488, Cl. 324-127.000.

Pemberton, Robert E. Chain drive. 4,099,424, Cl. 74-251.00R.

Pennwalt Corporation: *See—*
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Peppel, Jon H., to Clark Equipment Company. Lock-up clutch control valves. 4,099,603, Cl. 192-3.310.

PepsiCo Inc.: *See—*
Ratliff, Roger D., 4,099,764, Cl. 296-24.00R.

Perisic, Zoran. Optical method and apparatus for carrying out the method. 4,100,572, Cl. 358-93.000.

Perkins, Frank A., to Harris Corporation. Adaptive linearizing acoustic coupling system. 4,100,373, Cl. 179-1.00C.

Perkins, William Clarence: *See—*
Maggiulli, Cataldo Aldino; Burness, Donald MacArthur; and Perkins, William Clarence, 4,100,200, Cl. 260-609.00R.

Perreault, Donald A., to Xerox Corporation. Frequency domain automatic equalizer utilizing the discrete Fourier transform. 4,100,604, Cl. 364-827.000.

Perrier, Pierre; and Razet, Maurice L., to Societe Anonyme pour l'Equipement Electrique des Vehicules S.E.V. Marchal. Ignition coil for internal combustion engine. 4,099,510, Cl. 123-148.00D.

Perrot, Rene; and Mazodier, Jean-Louis, to Societe de Vente de l'Aluminium Pechiney. Method of producing hollow bodies in aluminum-silicon alloys by powder-extrusion. 4,099,314, Cl. 29-420.000.

Perrotti, Emilio: *See—*
Maspero, Federico; and Perrotti, Emilio, 4,100,208, Cl. 568-902.000.

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Pesa, William A. Folding knife. 4,099,327, Cl. 30-161.000.

Peter, Gunter: *See—*
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Peter, Heinz; Reinehr, Dieter; and Troxler, Eduard, to Ciba-Geigy Corporation. Curable mixtures. 4,100,111, Cl. 528-116.000.

Peters, Edwin F.: *See—*
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Peterson, Clifford D., to AMF Incorporated. Lawn mowers. 4,099,366, Cl. 56-13.600.

Peterson, Wallace W.; and Anderson, Oscar L. Plumb-rule. 4,099,331, Cl. 33-88.000.

Petitpierre, Jean Claude, to Ciba-Geigy Corporation. Thiazolylphthalide compounds. 4,100,169, Cl. 260-306.80R.

Petrillo, Vincenzo: *See—*
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Petro-Tex Chemical Corporation: *See—*
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Petrov, Zafir. Core for deep draw molding a closure cap for bottles and the like. 4,099,903, Cl. 425-388.000.

Peyman, Gholam A. Wide-angle cutter vitrophage. 4,099,529, Cl. 128-305.000.

Pezzuto, Michael, Jr., to Beatrice Foods Company. Seamless flooring and method and compositions for making same. 4,100,125, Cl. 260-29.6TA.

Pfeffer, Peter; and Ragaly, Istvan, to Robert Bosch GmbH. Multi-voltage vehicular network system. 4,100,474, Cl. 320-17.000.

Pfizer Inc.: *See—*
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Cue, Berkeley W., 4,100,284, Cl. 424-250.000.
Hammen, Philip D., 4,100,347, Cl. 544-49.000.

Pfleger, Frederick W. Inertia printing member. 4,099,459, Cl. 101-35.000.

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Andren, Lars-Goran Hjalmar; Bjorkman, Rune Harald; Easterday, Richard Lee; and Munktell, Hans Gosta, 4,099,882, Cl. 356-181.000.

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Phillips, C. Frank; and Leavens, Dwight E., to SCM Corporation. Process for obtaining free fatty acids from soap stock. 4,100,181, Cl. 260-416.000.

Phillips, Charles Walter, to Grandeur Motorcar Corp. Method of converting motor car. 4,099,313, Cl. 29-416.000.

Phillips, David C.: *See—*
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Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., 4,100,327, Cl. 428-339.000.
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Smith, Dexter E., 4,100,266, Cl. 423-574.00R.
Stapp, Paul R., 4,100,362, Cl. 560-246.000.
Piber, Earl T., to Cutler-Hammer, Inc. Industrial reversing speed control trigger switches having snap-in modules. 4,100,383, Cl. 200-157.000.
Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, to English Electric Valve Company Limited. Multipactor discharge tuned co-axial magnetrons. 4,100,458, Cl. 315-39.550.
Pickles, John, to Crosrol Limited. A method of removing a carding web from a carding machine. 4,099,295, Cl. 19-106.00R.
Pieper, Helmut, to Sorg GmbH & Co. KG. Glass melting furnace and process with recirculation of molten glass. 4,099,951, Cl. 65-135.000.
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Pittman, John B., to Telex Computer Products, Inc. Solenoid operated cone brake. 4,099,601, Cl. 188-163.000.
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Poe, Lloyd R.; and Sawyer, Frank L., to Hartwell Corporation. Pin latch structure. 4,099,751, Cl. 292-139.000.
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Polaroid Corporation: *See—*
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Johnson, Bruce K., 4,100,555, Cl. 354-166.000.
Land, Edwin H., 4,099,858, Cl. 351-62.000.
Wareham, Richard R.; and Gold, Nicholas, 4,100,559, Cl. 354-277.000.
Pollmeier, Werner, to Nisdorf Computer AG. Circuit for the production of an output voltage depending on an input direct voltage and a given desired voltage. 4,100,595, Cl. 363-133.000.
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Pops, Horace; and Johnson, Barry C., to Essex Group. Method for effecting reverse shape memory phenomena in Cu-Zn-Si brass alloy. 4,099,991, Cl. 148-11.50C.
Por, L. Laslo. Position responsive two-way ball valve. 4,099,655, Cl. 222-211.000.
Porner, Miroslav Joseph. Protective device. 4,099,269, Cl. 2-16.000.
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Carter, David; Withnall, Malcolm; Williams, Alan; Redshaw, Digby Ralph; and Stevens, Richard William, 4,100,379, Cl. 179-147.00R.
Cooper, Kenneth; Groves, Ian Stanley; Leigh, Peter Alexander; McIntyre, Neil; O'Hara, Sydney; and Speight, John Donald, 4,099,38, Cl. 29-578.000.
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Powell, Justin C. to Texaco Inc. Process and means for absorbing and releasing thermal energy by utilizing the allothopic change of endo-5-norbornene-2, 3-dicarboxylic acid anhydride with heat. 4,100,091, Cl. 252-70.000.
Powers, William J., III, to Texaco Inc. Preparation of overbased metal naphthenate lubricating oil compositions. 4,100,084, Cl. 252-39.000.
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Barch, Herbert W.; and Bohy, August G., 4,099,307, Cl. 28-252.000.
Donley, Harold E., 4,100,330, Cl. 428-429.000.
Pecoraro, George A., 4,099,950, Cl. 65-99.00A.
Schwenninger, Ronald L., 4,099,952, Cl. 65-182.00R.
Pracht, Hans J.: *See—*
Burns, Michael E.; and Pracht, Hans J., 4,100,094, Cl. 252-89.00R.
Prior, Michael D.: *See—*
Morris, John C.; Weidman, James K.; and Prior, Michael D., 4,099,708, Cl. 266-281.000.
Pritchard, Eric K. Stepping motor control circuit. 4,100,471, Cl. 318-685.000.
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Burns, Michael E.; and Pracht, Hans J., 4,100,094, Cl. 252-89.00R.
Flautt, Thomas Joseph, Jr., 4,100,017, Cl. 162-111.000.
Gregg, Richard, 4,100,305, Cl. 426-385.000.
Gregg, Richard; Weikel, James A.; Patel, Jayantilal M.; and Durchholz, Richard F., 4,100,306, Cl. 426-386.000.
Hutchins, James Peyton; Julian, Donald Victor; and Burns, Michael Eugene, 4,100,095, Cl. 252-99.000.
Proctor & Schwartz, Inc.: *See—*
Mullin, Joseph V.; and Sauer, W. Edwin, 4,099,338, Cl. 34-35.000.
Produits Chimiques Ugine Kuhlmann: *See—*
Manier, Francis Rene Daniel; and Caullet, Pierre Leon Adolphe, 4,100,131, Cl. 260-42.210.
Progressive Machinery Corporation: *See—*
Wilbur, William T., 4,100,391, Cl. 219-81.000.
Prosperi, Giulio; Marconi, Walter; Giovenco, Silvia; and Morisi, Franco, to Snam Progetti S.p.A. Method for improving the activity of oxireductase enzymes embedded in filamentary structures. 4,100,029, Cl. 195-68.000.
Pudenz, Alfred, to B. Braun Instruments. Process for fixing the center of rotation between the legs of two-legged devices. 4,099,315, Cl. 29-434.000.
Pugliese, Leonard A.; and Stroup, James P., to Latrobe Steel Company. Tubular products and methods of making the same. 4,099,992, Cl. 148-11.50N.
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Adler, Franklin P., 4,099,468, Cl. 105-310.000.
Purdue Research Foundation: *See—*
Etzel, James E., 4,100,065, Cl. 210-38.00B.
Quast, Hein: *See—*
Fischler, Hans-Michael; Bauer, Dieter; and Quast, Hein, 4,100,195, Cl. 260-576.000.
Queneau, Paul B.: *See—*
Chou, Eddie C.; Queneau, Paul B.; Laferty, John M.; and Carlberg, John R., 4,100,043, Cl. 204-108.000.
Quesnell, Harris A., Jr., to United States of America, Navy. High speed manchester encoder. 4,100,541, Cl. 340-347.0DD.
Questor Corporation: *See—*
Nisper, Kenneth J., 4,099,730, Cl. 277-139.000.
Quietzsch, Gerhard; Greiner, Bernd; and Pelz, Lothar, to Hoechst Aktiengesellschaft. Apparatus for measuring electric current. 4,100,488, Cl. 324-127.000.
R. Ritter Corporation: *See—*
Barnes, John A., 4,099,807, Cl. 315-127.000.
R. T. Vanderbilt Company, Inc.: *See—*
Hill, Harry Elwyn, 4,100,132, Cl. 260-42.460.
Raab, Guenter: *See—*
Sommer, Klaus; and Raab, Guenter, 4,100,067, Cl. 210-58.000.
Ragaly, Istvan: *See—*
Pfeffer, Peter; and Ragaly, Istvan, 4,100,474, Cl. 320-17.000.
Raichle, Karl: *See—*
Hess, Bernhard; Raichle, Karl; Bottenbruch, Ludwig; Schulz-Walz, Hansjochen; and Alberts, Heinrich, 4,100,224, Cl. 260-862.000.
Rainey, Robert M., to Varian Associates, Inc. Target profile for sputtering apparatus. 4,100,055, Cl. 204-298.00
Randall, Charles E., to Westinghouse Electric Corp. Method and

apparatus for fastening a door panel to a door operator mounted on an elevator car. 4,099,599, Cl. 187-52.00R.

Rappoport, Marc D. Geothermal and solar integrated energy transport and conversion system. 4,099,381, Cl. 60-641.000.

Rarig, Larry L.: *See—*
Brennan, Leon E.; Lagermasini, Joseph P.; and Rarig, Larry L., 4,099,607, Cl. 198-341.000.

Rasmussen, Poul Rodbroe: *See—*
von Daehne, Welf; and Rasmussen, Poul Rodbroe, 4,100,276, Cl. 424-238.000.

Rasmussen, Stig: *See—*
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Ratliff, Roger D., to PepsiCo Inc. Overhead door locking device. 4,099,764, Cl. 296-24.00R.

Raue, Roderich: *See—*
Walther, Herbert; Hartig, Wolfgang; Friedrich, Adolf; and Raue, Roderich, 4,100,509, Cl. 331-94.50L.

Raychem Corporation: *See—*
Cammack, Travers Kregg, II; and Nyberg, David Dolph, 4,100,089, Cl. 252-63.000.

Raymond Lee Organization, Inc.: *See—*
Loustaunau, Louie E., 4,099,480, Cl. 116-135.000.

Rayson, Robert L.: *See—*
Mascotte, Lawrence L.; and Rayson, Robert L., 4,099,760, Cl. 293-73.000.

Raytheon Company: *See—*
Woythaler, Saul L., 4,100,376, Cl. 179-15.0BP.

Razet, Maurice L.: *See—*
Perrier, Pierre; and Razet, Maurice L., 4,099,510, Cl. 123-148.00D.

RCA Corporation: *See—*
Berkman, Samuel; Duffy, Michel Thomas; Kim, Kyong-Min; and Cullen, Glenn Wherry, 4,099,924, Cl. 23-273.0SP.
Beyers, Billy Wesley, Jr., 4,099,372, Cl. 58-85.500.
Gange, Robert Allen, 4,100,449, Cl. 313-337.000.
Hagino, Shunji, 4,100,465, Cl. 318-41.000.
Hammer, Jacob Meyer; and Neil, Clyde Carl, 4,100,313, Cl. 427-162.000.
Huff, Larry Dean, 4,099,724, Cl. 274-47.000.
Khajezadeh, Heshmat; and Ahrens, Stephen Carl, 4,100,565, Cl. 357-51.000.
Ollendorf, Joel, 4,100,561, Cl. 357-13.000.
Rosnowski, Wojciech, 4,099,997, Cl. 148-187.000.
Shwartzman, Stanley, 4,099,417, Cl. 73-606.000.
Smith, Joseph Leland, 4,100,518, Cl. 335-212.000.
Wittke, James Pleister, 4,100,508, Cl. 331-94.50H.

Readshaw, Ronald Louis: *See—*
Walter, Andrew Tainter; Bryant, George Macon; and Readshaw, Ronald Louis, 4,099,913, Cl. 8-173.000.

Realty & Industrial Corporation: *See—*
Gubelmann, William S., deceased; and Grier, William R., 4,099,606, Cl. 400-4.000.

Recaro GmbH & Co.: *See—*
Goldner, Walther, 4,099,779, Cl. 297-408.000.
Schmidhuber, Karl, 4,099,780, Cl. 297-411.000.

Reddy, Junuthula Nirdosh, to Bendix Corporation, The. System controlling any air/fuel ratio with stoichiometric sensor and asymmetrical integration. 4,099,491, Cl. 123-32.0EE.

Redford, David A., to Texaco Exploration Canada Ltd. Vicous oil recovery method. 4,099,566, Cl. 166-260.000.

Redmond, Stephen L.; Means, James E.; and Osburn, Michael R., to United States of America, Navy. Trajectory adaptive safety-arming device. 4,099,466, Cl. 102-215.000.

Redshaw, Digby Ralph: *See—*
Carter, David; Withnall, Malcolm; Williams, Alan; Redshaw, Digby Ralph; and Stevens, Richard William, 4,100,379, Cl. 179-147.00R.

Regan, Ernest E.: *See—*
McCann, Thomas J.; and Regan, Ernest E., 4,100,318, Cl. 428-159.000.

Reggiani, Marcello; and Marchetti, Franco, to Selenia-Industrie Elettroniche Associate S.p.A. Stabilization systems for IMPATT diode microwave oscillators or amplifiers, and similar active components. 4,100,510, Cl. 331-107.00R.

Regnier, Gilbert; Canevari, Roger; Poignant, Jean-Claude; and Laubie, Michel, to Science Union et Cie. 2-(Substituted heterocyclic amine)-benzoic acids. 4,100,286, Cl. 424-251.000.

Reid, Robert Edward: *See—*
Napolitano, Orlando; Reid, Robert Edward; Saltzberg, Burton R.; Stochel, Nathan Harold; and Tingley, John Ronald, 4,100,533, Cl. 340-147.00R.

Reid, Thomas James: *See—*
Cross, Graham Westwood; and Reid, Thomas James, 4,099,464, Cl. 102-24.0HC.

Reighard, Alan B.: *See—*
Scholl, Charles H.; and Reighard, Alan B., 4,099,653, Cl. 222-146.0HE.

Reinehr, Dieter: *See—*
Peter, Heinz; Reinehr, Dieter; and Troxler, Eduard, 4,100,111, Cl. 528-116.000.

Reinehr, Ulrich: *See—*
Wolf, Gerhard Dieter; Schnoor, Werner; Voegele, Jean-Claude; Reinehr, Ulrich; and Nischk, Gunther, 4,100,143, Cl. 526-301.000.

Reinhardt, Nils; Kuylenstierna, Ulf Vilhelm; and Alfredsson, Bengt Agne, to Sotex AB. Method of recovering metals out of soot originating from the combustion of oil. 4,100,251, Cl. 423-63.000.

Reinke, Friedhelm; Mackenberger, Ludwig; and Siefert, Eckhard, to AEG-Elotherm, G.m.b.H. Apparatus for the inductive heating of workpieces especially for the heating of cam shafts. 4,100,387, Cl. 219-10.570.

Reinker, Dieter: *See—*
Koller, Stefan; Reinker, Dieter; and Schwander, Hans Rudolf, 4,099,909, Cl. 8-41.00C.

Reissig, Dirk: *See—*
Muth, Hans-Albrecht; Reissig, Dirk; and Marwitz, Hans-Gunther v.d., 4,099,645, Cl. 220-304.000.

Reitmayer, Franz: *See—*
Faulstich, Marga; Neuroth, Norbert; Reitmayer, Franz; and Krolla, Georg, 4,099,834, Cl. 350-96.340.

Rekers, Louis J.: *See—*
Katzen, Stanley J.; and Rekers, Louis J., 4,100,104, Cl. 252-428.000.

Renner, Alfred: *See—*
Zahir, Abdul-Cader; and Renner, Alfred, 4,100,140, Cl. 526-90.000.

Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, to Boehringer Ingelheim GmbH. N-Aryl-N'-(phenyl- or phenoxy-alkyl)-piperazines and salts thereof. 4,100,282, Cl. 424-246.000.

Research Institute for Iron, Steel and other Metals of the Tohoku University, The: *See—*
Yajima, Seishi; Hayashi, Josaburo; and Omori, Mamoru, 4,100,233, Cl. 423-345.000.

Rethore, Gerard. Reading aid. 4,099,851, Cl. 350-246.000.

Reticon Corporation: *See—*
Weckler, Gene P., 4,100,513, Cl. 333-70.00T.

Reynolds, Gordon S.: *See—*
Sorenson, James L.; Pannier, Karl A., Jr.; and Reynolds, Gordon S., 4,099,528, Cl. 128-214.400.

Reynolds, Howard: *See—*
Stegmaier, Louis T.; and Reynolds, Howard, 4,099,828, Cl. 339-258.00F.

Reynolds Metals Company: *See—*
Lee, Harry W., Jr., 4,099,475, Cl. 113-116.0QA.

Reynolds, Ronald W., to Sun Oil Company of Pennsylvania. Manufacture of naphthenic type lubricating oils. 4,100,056, Cl. 208-57.000.

RF Products Corp.: *See—*
Callahan, John A.; and Ottenstein, Allan S., 4,100,400, Cl. 235-92.0FL.

Rhone-Poulenc Industries: *See—*
Decor, Jean-Pierre, 4,100,201, Cl. 260-615.00A.
Meiller, Francois; and Mirabel, Bernard, 4,100,149, Cl. 260-112.00R.
Mercier, Jules, 4,100,189, Cl. 260-541.000.

Rialdi, Giorgio. Compositions for the treatment of glass surfaces. 4,100,093, Cl. 252-89.00R.

Richard Heinze, Firma: *See—*
Pittasch, Willi, 4,099,293, Cl. 16-149.000.

Richardson Industries, Inc.: *See—*
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Richardson, Roy A., to Richardson Industries, Inc. Towing vehicle. 4,099,628, Cl. 212-65.000.

Ricoh Co., Ltd.: *See—*
Ohno, Yukihiro, 4,099,484, Cl. 118-117.000.
Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, 4,099,970, Cl. 96-1.50N.

Riemens, Karel: *See—*
Boudewijns, Henricus P. J.; Riemens, Karel; and Eggermont, Ludwig D. J., 4,100,494, Cl. 325-38.00B.

Rienecker, Frederick, Jr.: *See—*
Kobierecki, Marian W.; and Rienecker, Frederick, Jr., 4,099,852, Cl. 350-247.000.

Righi, Nardino; and Gavioli, Roberto, to Eurafrica S.R.L. Societa' per Ricerche Elettroniche e Audiovisivi; and Gavioli, Roberto. Audiovisual apparatus. 4,100,582, Cl. 360-80.000.

Riken Piston Ring Industrial Co. Ltd.: *See—*
Ikawa, Katsuya; and Tanaka, Yuichi, 4,099,994, Cl. 148-35.000.

Riley, Michael O.: *See—*
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Rimmelzwaan, Franciscus Jacobus: *See—*
van den Einden, Henricus Fransiscus Petrus; Kamerbeek, Djuurd Anne Geertruid; and Rimmelzwaan, Franciscus Jacobus, 4,100,453, Cl. 313-417.000.

Ringel, Reginald K.: *See—*
Beckham, Joel M.; Easterling, Gene B.; Ringel, Reginald K.; and Wolff, Egon E., 4,099,577, Cl. 172-781.000.

Ringrose, Peter Stuart: *See—*
Atherton, Frank Ratcliffe; Hall, Michael John; Hassall, Cedric Herbert; Ringrose, Peter Stuart; and Lambert, Robert Wilson, 4,100,275, Cl. 424-211.000.

Ripple Twist Mills, Inc.: *See—*
Herbein, Herbert H., 4,099,389, Cl. 66-9.00R.

Rischawy, Dorothea Wilfert nee, heir: *See—*
Schmid, Walter; Jambor, Arno; Wilfert, Karl, deceased; and Wilfert, Thomas, heir, 4,099,792, Cl. 303-113.000.

Rittenbaum, Jeffrey A.: *See—*
Rittenbaum, Max; and Rittenbaum, Jeffrey A., 4,099,288, Cl. 15-228.000.

Rittenbaum, Max; and Rittenbaum, Jeffrey A., to Max Rittenbaum, Inc. Dust mitt with optional handle. 4,099,288, Cl. 15-228.000.

Riverside Clay Company: *See—*
Morris, John C.; Weidman, James K.; and Prior, Michael D., 4,099,708, Cl. 266-281.000.

Robert Bosch GmbH: *See—*
Binder, Georg; Lindauer, Rolf; Sohnle, Rudiger; and Wahler, Harald, 4,100,440, Cl. 310-89.000.
Brill, Klaus; and Schmid, Gunter, 4,099,663, Cl. 228-159.000.
Gansert, Willi; and Slansky, Harry, 4,100,475, Cl. 320-35.000.
Kiencke, Uwe; Flaig, Ulrich; Zechnall, Martin; and Honig, Gunter, 4,099,495, Cl. 123-32.0EB.
Latsch, Reinard; and Bianchi, Valerio, 4,099,493, Cl. 123-32.0EA.
Pagel, Ernst-Olav; and Borst, Wolfgang, 4,099,507, Cl. 123-148.00E.
Pfeffer, Peter; and Ragaly, Istvan, 4,100,474, Cl. 320-17.000.
Stumpp, Gerhard; Wessel, Wolf; and Stein, Volkard, 4,099,505, Cl. 123-139.0AW.

Robert Strada Design Associates, Inc.: *See—*
Strada, Robert, 4,099,627, Cl. 211-163.000.

Roberts, Charles C., Jr. Variable thermal conductance reflux heat pipe. 4,099,556, Cl. 165-96.000.

Roberts, Lawrence T.; and Strom, Thomas H. All-axis control of aircraft in deep stall. 4,099,687, Cl. 244-7.00R.

Robertshaw Controls Company: *See—*
Brakebill, Harold G., 4,099,539, Cl. 137-84.000.
Marquis, Edgar E., 4,100,381, Cl. 200-38.00A.
Steele, Everett T., Jr.; and Weaver, Marvin P., 4,099,706, Cl. 251-367.000.

Robins, Janis; and Zollinger, J. Lamar, to Minnesota Mining and Manufacturing Company. Storage-stable epoxy-terminated silane prepolymer. 4,100,134, Cl. 528-10.000.

Robinson, Pablo T. Multi-tier game board. 4,099,723, Cl. 273-241.000.

Rockford Manufacturing Group, Inc.: *See—*
Alcock, Richard A.; and Guthrie, Robert M., 4,099,403, Cl. 72-288.000.

Rockwell International Corporation: *See—*
Dorsman, Adrian K., 4,099,876, Cl. 356-106.0LR.
George, Peter K., 4,100,608, Cl. 365-2.000.
Lesser, Mark B., 4,100,430, Cl. 307-205.000.
Spence, John R., 4,100,460, Cl. 315-162.000.

Rode, Ernst-Dietrich; and Winkler, Hans-Georg, to E.D. Rode KG. Method of regulating cathode current density in an electroplating process. 4,100,036, Cl. 204-14.00R.

Rodesch, Dale F.; and Johnson, George E., to Centronics Data Computer Corp. Electronic slot machine. 4,099,722, Cl. 273-143.00R.

Rodewald, Paul G., to Mobil Oil Corporation. Isomerization with catalyst of graphite containing intercalated acid and fluoride. 4,100,213, Cl. 260-666.00P.

Rodewald, Paul G., to Mobil Oil Corporation. Silica-modified zeolite catalyst and conversion therewith. 4,100,219, Cl. 260-682.000.

Rodolfi, Giorgio, to Bassani Ticino S.p.A. Electrical contactors. 4,100,517, Cl. 335-132.000.

Rogers, Michael James, to Newall Engineering Company Ltd., The. Phase displaced measurement of contiguous spherical balls. 4,100,485, Cl. 324-208.000.

Rogge, Virgil D.: *See—*
Fischer, William; and Rogge, Virgil D., 4,099,560, Cl. 166-0.500.

Rohm and Haas Company: *See—*
Emmons, William D.; Sperry, Peter R.; and Nyi, Kayson, 4,100,133, Cl. 260-45.90L.

Roley, Robert D., to Caterpillar Tractor Co. Track-type vehicle undercarriage. 4,099,795, Cl. 305-18.000.

Romano, Ugo; and Tesei, Renato, to Anic, S.p.A. Method for preparing aromatic urethans. 4,100,351, Cl. 560-24.000.

Rondeaux, Louis; Legrand, Jules; and Baelde, Claude, to Polysius AG. Installation for heating starting materials for glass melting. 4,099,953, Cl. 65-335.000.

Rosenberg, William E., to Columbia Chemical Corporation. Electrodeposition of bright zinc utilizing aliphatic ketones. 4,100,040, Cl. 204-55.00R.

Rosnowski, Wojciech, to RCA Corporation. Method of fabricating a semiconductor device. 4,099,997, Cl. 148-187.000.

Ross, Frederick W. Impact device with linear air spring. 4,099,580, Cl. 173-118.000.

Roussel Uclaf: *See—*
Clemence, Francois; and Humbert, Daniel, 4,100,291, Cl. 424-267.000.
Grandadam, Jean Andre; and Heurtaux, Simone, 4,100,297, Cl. 424-304.000.
Nedelec, Lucien; Frechet, Daniel; Dumont, Claude; and Kannengiesser, Marie-Helene, 4,100,278, Cl. 424-244.000.

Rovesti, William: *See—*
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Rowe, Carleton N.: *See—*
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Rowland, Michael Roger: *See—*
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Roy, Raymond L.: *See—*
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Rubin, Jack C., to Addressograph Multigraph Corp. Cleaner for hydrophilic metal surfaces of lithographic duplicators. 4,100,096, Cl. 252-145.000.

Rucinski, Michael E.: *See—*
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Rudenskaya, Galina Nikolaevna: *See—*
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Rudner, Bernard: *See—*
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Rudolph, Otfried: *See—*
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Ruemeli, Robert F. Shading unit for plant propagation. 4,099,344, Cl. 47-26.000.

Rugh, John D.: *See—*
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Runyan, Gary L., to Celanese Corporation. End entry ball valve with seal wear compensation and force isolated seal. 4,099,705, Cl. 251-171.000.

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Ufken, Gregory Allen; and Ruopsa, Jon Arthur, 4,099,937, Cl. 55-212.000.

Rusch, Larry P.: *See—*
Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, 4,100,264, Cl. 423-430.000.

Russell, William J., to United States of America, Army. Chromate-free etching process and composition for preparing aluminum for adhesive bonding. 4,100,015, Cl. 156-665.000.

Rutgerswerke Aktiengesellschaft: *See—*
Hockenberger, Lothar; Soyka, Manfred; and Wilhelm, Gerhard, 4,100,148, Cl. 528-374.000.

Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of alkylphenols or 1-naphthols catalyzed by cupric complexes. 4,100,202, Cl. 568-730.000.

Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of alkylphenols or 1-naphthols catalyzed by metal complexes of an oxime of a keto or aldehyde compound. 4,100,203, Cl. 568-730.000.

Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of alkylphenols or 1-naphthols catalyzed by metal complexes of a hydroxy- or keto-acid compound. 4,100,204, Cl. 568-730.000.

Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of alkylphenols or 1-naphthols catalyzed by meal complexes of aminoketo compounds. 4,100,205, Cl. 568-730.000.

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Ruzin, Leonid Mikhailovich: *See—*
Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.

Ryder, Lyle C.: *See—*
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Sacks, Bernard R. Adjustable tension tennis racket. 4,099,717, Cl. 273-73.00E.

Safety Consultants: *See—*
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Sagami Chemical Research Center: *See—*
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Sagasta, D. Lucio Arana. Arrangements used for shoring excavations in the ground. 4,099,386, Cl. 61-45.00R.

Sahara, Tamotsu, to Hitachi Plant Engineering and Construction Co., Ltd. Sprinkler head. 4,099,573, Cl. 169-37.000.

Sahli, Fritz, to Fritschi, Albert. Drafting table. 4,099,469, Cl. 108-1.000.

Saint-Supery, Christian: *See—*
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Saito, Minoru: *See—*
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Saito, Sakae: *See—*
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Saito, Satoshi: *See—*
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Sakashita, Masami: *See—*
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Sakitani, Yoshio: *See—*
Okumura, Masahide; Sakitani, Yoshio; Nakaisumi, Yasushi; and Nakata, Toshiaki, 4,099,704, Cl. 251-134.000.

Salaun, Andre; and Trempu, Rene, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Process and apparatus for the purification of fumes and gases and for the production of sulfuric acid. 4,100,259, Cl. 423-242.000.

Salter, Lowell S., Jr., to Morgan Construction Company. Seal. 4,099,731, Cl. 277-164.000.

Saltzberg, Burton R.: *See—*
Napolitano, Orlando; Reid, Robert Edward; Saltzberg, Burton R.; Stochel, Nathan Harold; and Tingley, John Ronald, 4,100,533, Cl. 340-147.00R.

Sampei, Tohru: *See—*
Nakagaki, Harushige; Sampei, Tohru; Amada, Nobutaka; and Baba, Tatsuo, 4,100,501, Cl. 330-263.000.

Sampson, Joseph: *See—*
Dix, Joseph F.; and Sampson, Joseph, 4,099,361, Cl. 53-42.000.

Sampson, William J.: *See—*
Christensen, Bryan L.; Sampson, William J.; Brogger, Ronald L.; and Lee, Jeffrey A., 4,099,285, Cl. 15-83.000.

Samuel Moore and Company: *See—*
Kavick, Edward M., 4,099,748, Cl. 285-256.000.
Moore, Bruce H., 4,099,425, Cl. 74-501.00P.

San-O Industrial Co., Ltd.: *See—*
Arikawa, Hiroo; and Maruo, Masaya, 4,100,523, Cl. 337-163.000.

Sandall, William R.: *See—*
MacRae, Donald R.; Gold, Richard G.; Sandall, William R.; and Thompson, Charles D., 4,099,958, Cl. 75-0.5BA.

Sander, Georg; Jacobson, Sven Eric; and Ericson, Ake Magnus Ivar, to Combustion Engineering, Inc. Apparatus for cleaning the air nozzles and regulating air flow thereto in chemical recovery boilers. 4,099,471, Cl. 110-182.500.

Sanders Associates, Inc.: *See—*
Johnson, Philip M.; and Kuppenheimer, John D., Jr., 4,100,404, Cl. 250-199.000.

Sandham, Edwin C., to Leggett & Platt, Incorporated. Stenographer's chair. 4,099,774, Cl. 297-298.000.

Sandoz, Inc.: *See—*
Galantay, Eugene E., 4,100,300, Cl. 424-343.000.
Houlihan, William J., 4,100,165, Cl. 260-288.0CF.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Arimitsu, Tetsuya, 4,099,479, Cl. 115-41.00R.

Santucci, Nicola, to Nuovo Pignone S.p.A. Device for varying the beating-up position of the reed of a textile loom for Turkish towelling. 4,099,546, Cl. 139-27.000.

Sartori, Guido; and Lundberg, Robert D., to Exxon Research & Engineering Co. Oil-plasticized copolymers of SO_2 and olefins. 4,100,128, Cl. 260-33.6UA.

Sartori, Guido; and Savage, David W., to Exxon Research & Engineering Co. Process and amine-solvent absorbent for removing acidic gases from gaseous mixtures. 4,100,257, Cl. 423-226.000.

Sasaki, Katsutoshi: *See—*
Nakajima, Takayoshi; Sonoda, Hiroshi; Sasaki, Katsutoshi; and Hane, Teruaki, 4,100,009, Cl. 156-184.000.

Sasaki, Masaomi: *See—*
Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, 4,099,970, Cl. 96-1.50N.

Sasaki, Toshiyuki, to Hitachi, Ltd. Contactless ignition apparatus for internal combustion engine. 4,099,498, Cl. 123-117.00R.

Sasayama, Takao, to Hitachi, Ltd. Power transistor device. 4,100,564, Cl. 357-46.000.

Sato, Susumu: *See—*
Yasuda, Eturo; Sato, Susumu; Segawa, Yoshihiro; Hattori, Tadashi; and Aoki, Keiji, 4,099,922, Cl. 23-254.00E.

Sato, Tadashi: *See—*
Takano, Hideo; Saito, Satoshi; Sato, Tadashi; Yamaguchi, Tuyoshi; and Narita, Yoshihiro, 4,099,897, Cl. 425-4.00C.

Sato, Yuzuru; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenji; and Oya, Tadanori, to Mitsubishi Chemical Industries Limited; and Konishiroku Photo Industry Co., Ltd. Dye image forming process using shifted azo dye developer. 4,099,972, Cl. 96-29.00D.

Satya, Akella V. S.: *See—*
Casowitz, Barry N.; Cowan, Michael D.; Humphreys, Charles B.; and Satya, Akella V. S., 4,100,486, Cl. 324-62.000.

Saucy, Gabriel: *See—*
Chan, Ka-Kong; and Saucy, Gabriel, 4,100,175, Cl. 260-345.500.

Sauer, W. Edwin: *See—*
Mullin, Joseph V.; and Sauer, W. Edwin, 4,099,338, Cl. 34-35.000.

Saurer-Allma GmbH: *See—*
Bager, Reinhard, 4,100,399, Cl. 235-92.0CC.

Savage, David W.: *See—*
Sartori, Guido; and Savage, David W., 4,100,257, Cl. 423-226.000.

Savage, Milton B. Combined opthalmic lens pattern rack and dispenser. 4,099,806, Cl. 312-117.000.

Savoit, Robert E.; and Henry, Clemence J., to Texaco Inc. Method for retarding the evaporation of water. 4,099,915, Cl. 21-60.50A.

Sawaki, Toru: *See—*
Ichikawa, Yataro; Suzuki, Nobuo; and Sawaki, Toru, 4,100,180, Cl. 260-347.800.

Sawayama, Isao; and Endo, Hajime, to Taiheiyo Engineering Incorporated. Apparatus for automatically shifting the conveyor at the pit face in the coal mine. 4,099,781, Cl. 299-1.000.

Sawyer, Frank L.: *See—*
Poe, Lloyd R.; and Sawyer, Frank L., 4,099,751, Cl. 292-139.000.

Schaaber, Otto: *See—*
Muller, Hermann; and Schaaber, Otto, 4,099,993, Cl. 148-14.000.

Schaefer, Peter; Mason, Peter Alan; and Yates, William Harold, to Fiber Industries, Inc. Polyester process and product. 4,100,142, Cl. 526-68.000.

Schael, Rudi. Illumination unit for microfilm readers. 4,100,591, Cl. 362-190.000.

Schalausky, Horst: *See—*
Neumann, Henning; Schalausky, Horst; and Britschinn, Horst, 4,099,656, Cl. 224-5.00W.

Schank, Richard L.: *See—*
Chu, Joseph Y.; and Schank, Richard L., 4,100,135, Cl. 528-11.000.

Scharnhorst, Kurt Peter: *See—*
Schwee, Leonard J.; Irons, Henry R.; Anderson, Wallace F.; Scharnhorst, Kurt Peter; and Krall, Albert D., 4,100,609, Cl. 365-87.000.

Schedrovitsky, Savaty Solomonovich: *See—*
Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Schedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich, 4,099,334, Cl. 33-346.000.

Schering Aktiengesellschaft: *See—*
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,026, Cl. 195-51.00G.
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,027, Cl. 195-51.00G.

Scherr, George H., to Technam, Inc. Preparation of gentamicin sensitized particles for agglutination tests. 4,100,268, Cl. 424-12.000.

Schertz, William W., to United States of America, Energy. Fabrication of trough-shaped solar collectors. 4,099,515, Cl. 126-271.000.

Schiedat, Heinz, to Stiebel Eltron GmbH & Co. KG. Pressure tank for hot-water heaters. 4,099,641, Cl. 220-444.000.

Schlemmer, John E. Machine for removing floor covering. 4,099,328, Cl. 30-172.000.

Schlesinger, Sheldon Irwin; and Boszak, Ronald J., to American Can Company. Powdered tonor image containing article. 4,100,321, Cl. 428-207.000.

Schlumberger Technology Corporation: *See—*
Bernard, James I.; and Strom, Gerald A., 4,100,528, Cl. 340-18.0LD.

Schmerling, Louis; and Homeier, Edwin H., to UOP Inc. Carbonylation of alcohols. 4,100,359, Cl. 560-232.000.

Schmid, Gunter: *See—*
Brill, Klaus; and Schmid, Gunter, 4,099,663, Cl. 228-159.000.

Schmid, Walter; Jambor, Arno; Wilfert, Karl, deceased (by Rischawy, Dorothea Wilfert nee, heir); and by Wilfert, Thomas, heir, to Daimler-Benz Aktiengesellschaft. Brake force controller for vehicles, particularly automotive vehicles. 4,099,792, Cl. 303-113.000.

Schmidhuber, Karl, to Recaro GmbH & Co. Airline passenger seat. 4,099,780, Cl. 297-411.000.

Schmidt, Fritz: *See—*
Kontsch, Otmar; and Schmidt, Fritz, 4,099,746, Cl. 285-119.000.

Schmidt, John, Jr.; and Aryamane, Avinash, to Littelfuse, Inc. Method of making a miniature plug-in fuse. 4,099,320, Cl. 29-623.000.

Schmitt, Hubert: *See—*
Tippmer, Kurt; Schmitt, Hubert; Vinke, Heinrich; and Abendroth, Georg, 4,099,929, Cl. 44-1.00F.

Schnabel, Gunter: *See—*
Waldmann, Karl; and Schnabel, Gunter, 4,100,340, Cl. 526-245.000.

Schneider, Abraham: *See—*
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,100,216, Cl. 260-666.0PY.
Suld, George; Schneider, Abraham; and Myers, Harry K., Jr., 4,100,338, Cl. 526-142.000.

Schneider, Joachim: *See—*
Jaedicke, Hagen; Paust, Joachim; and Schneider, Joachim, 4,100,197, Cl. 260-586.00P.

Schnoor, Werner: *See—*
Wolf, Gerhard Dieter; Schnoor, Werner; Voegele, Jean-Claude; Reinehr, Ulrich; and Nischk, Gunther, 4,100,143, Cl. 526-301.000.

Schochet, Frank E. Multi-purpose modification for lithographic platemaker. 4,100,560, Cl. 354-307.000.

Scholl, Charles H.; and Reighard, Alan B., to Nordson Corporation. Molten adhesive dispensing device. 4,099,653, Cl. 222-146.0HE.

Schoppelrey, Victor H. Mechanically adjustable electric outlet device. 4,099,824, Cl. 339-157.00C.

Schossler, Werner: *See—*
Heinemann, Otto; Schossler, Werner; Lucke, Helmut; Krumme, Helmut; and Heiringhoff, Burkhard, 4,099,802, Cl. 308-9.000.

Schott, Donald E., to Thomas C. Wilson, Inc. Versatile expanding apparatus for tubes and the like. 4,099,400, Cl. 72-122.000.

Schroeder, George Francis, to Singer Company, The. Cold start system for motors. 4,100,466, Cl. 318-102.000.

Schromm, Kurt: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,100,282, Cl. 424-246.000.

Schroter, Herbert; and Stein, Eckehard, to Hoechst Aktiengesellschaft. Copying apparatus, in particular photoprinting apparatus, comprising a developing chamber which operates according to the dry-development principle, and a dosing device for liquid developer medium. 4,099,868, Cl. 355-106.000.

Schrupp, Kenneth D.: *See—*
Gilligan, Patrick J.; and Schrupp, Kenneth D., 4,099,864, Cl. 355-37.000.

Schubert, Hermann: *See—*
Weissflog, Wolfgang; Schubert, Hermann; Kresse, Horst; Wiegeleben, Adalbert; and Demus, Dietrich, 4,099,856, Cl. 350-350.000.

Schuller, Georges: *See—*
Bruggert, Paul; and Schuller, Georges, 4,099,299, Cl. 24-73.0PS.

Schultz, James Edward; and Burns, Carmen D., to National Semiconductor Corporation. Apparatus for and method of shaping interconnect leads. 4,099,660, Cl. 228-13.000.

Schultz, Norman W. Automobile lock mechanism. 4,099,593, Cl. 180-114.000.

Schulz-Walz, Hansjochen: *See—*
Hess, Bernhard; Raichle, Karl; Bottenbruch, Ludwig; Schulz-Walz, Hansjochen; and Alberts, Heinrich, 4,100,224, Cl. 260-862.000.

Schumacher, William J.; and Tanczyn, Harry, to Armco Steel Corpora-

tion. Galling resistant austenitic stainless steel. 4,099,967, Cl. 75-128.00A.

Schurger, Rainer: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,099,605, Cl. 192-98.000.

Schwander, Hans Rudolf: *See—*
Koller, Stefan; Reinker, Dieter; and Schwander, Hans Rudolf, 4,099,909, Cl. 8-41.00C.

Schwartz, Kent J.: *See—*
Glock, Robert D.; Harris, Delbert L.; and Schwartz, Kent J., 4,100,272, Cl. 424-92.000.

Schwartz, Robert J., to Kimberly-Clark Corporation. Stabilized non-woven web. 4,100,319, Cl. 428-171.000.

Schwartz, Willis T., Jr., to Hooker Chemicals & Plastics Corp. Low profile additives in polyester systems. 4,100,229, Cl. 260-887.000.

Schwee, Leonard J.; Irons, Henry R.; Anderson, Wallace F.; Scharnhorst, Kurt Peter; and Krall, Albert D., to United States of America, Navy. Magnetoresistance detector for crosstie memories. 4,100,609, Cl. 365-87.000.

Schweizer, Alfred D.: *See—*
Brasey, Marcel; Schweizer, Alfred D.; and Shorrock, James C., 4,100,341, Cl. 536-56.000.

Schwenninger, Ronald L., to PPG Industries, Inc. Movable submersible dam barrier for use in a glass forming chamber. 4,099,952, Cl. 65-182.00R.

SCI Systems, Inc.: *See—*
King, Olin B., 4,100,551, Cl. 346-162.000.

Science Union et Cie: *See—*
Regnier, Gilbert; Canevari, Roger; Poignant, Jean-Claude; and Laubie, Michel, 4,100,286, Cl. 424-251.000.

Scientific-Atlanta, Inc.: *See—*
Mobley, Joseph Graham, 4,100,472, Cl. 318-685.000.

Scifres, Donald R.: *See—*
Burnham, Robert D.; and Scifres, Donald R., 4,099,999, Cl. 148-187.000.

SCM Corporation: *See—*
Gawrilow, Ilija, 4,100,308, Cl. 426-554.000.
Phillips, C. Frank; and Leavens, Dwight E., 4,100,181, Cl. 260-416.000.

Scolarma: *See—*
Giron, Jacques Pierre Max, 4,100,249, Cl. 264-313.000.

Scouten, Charles G.; and Hamilton, Willard C., to Xerox Corporation. Dicarboxylic acid bis-amides in electrostatic imaging compositions and processes. 4,099,968, Cl. 96-1.0SD.

Scripto, Inc.: *See—*
Fuller, David Lee, 4,099,907, Cl. 431-254.000.

Sea Containers, Ltd.: *See—*
Nessfield, Stanley; Foster, John Elliott; and Clive-Smith, Martin, 4,099,640, Cl. 220-6.000.

Sealed Unit Parts Co., Inc.: *See—*
Slocum, Charles W., 4,100,468, Cl. 318-221.00C.

Searle, Robert J. G.: *See—*
Bull, Michael J.; and Searle, Robert J. G., 4,100,363, Cl. 560-255.000.
Davis, Royston H.; and Searle, Robert J. G., 4,100,298, Cl. 424-304.000.

Seattle Box Co.: *See—*
Nist, Ferdinand J., Jr., 4,099,617, Cl. 206-443.000.

Securicum S.A.: *See—*
Moss, Maurice; Hill, Colin Barry; and Rowland, Michael Roger, 4,100,004, Cl. 156-60.000.

Segawa, Yoshihiro: *See—*
Yasuda, Eturo; Sato, Susumu; Segawa, Yoshihiro; Hattori, Tadashi; and Aoki, Keiji, 4,099,922, Cl. 23-254.00E.

Seibold, Robert W.; Parechanian, Haig S.; Weatherill, William T.; and Lowe, Robert E., to McDonnell Douglas Corporation. Fiber-resin-carbon composites and method of fabrication. 4,100,322, Cl. 428-257.000.

Seifert, Peter, to Black Clawson Company, The. Cone press. 4,099,458, Cl. 100-116.000.

Seissl, Johannes: *See—*
Goetzl, Horst; Grassme, Ulrich; and Seissl, Johannes, 4,100,417, Cl. 250-505.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Asano, Teryoshi, 4,100,307, Cl. 425-533.000.

Selenia-Industrie Elettroniche Associate S.p.A.: *See—*
Reggiani, Marcello; and Marchetti, Franco, 4,100,510, Cl. 331-107.00R.

Selvarajan, Radhakrishnan; and Ballweber, Edward G., to Nalco Chemical Company. Production of 1-aminoalkane-1, 1-diphosphonic acids using phosphorous acid and nitriles in a non-aqueous system. 4,100,167, Cl. 260-296.00R.

Semchena, John H.: *See—*
Binkley, Carl R.; Keir, John B.; and Semchena, John H., 4,099,541, Cl. 137-596.130.

Semperit Aktiengesellschaft: *See—*
Heissenberger, Oswald, 4,099,614, Cl. 206-299.000.

Senda, Katsuyuki: *See—*
Noguchi, Yoshikazu; Senda, Katsuyuki; and Kobashi, Mamoru, 4,099,508, Cl. 123-148.0DC.

Senior, Robert B.; and Karasinski, Frederick, to Gardner-Denver Company. Cutting and insulation stripping apparatus for twisted wire pair. 4,099,428, Cl. 81-9.510.

Sepp, Gunther: *See—*
Born, Gunthard; Hermansdorfer, Hans; Sepp, Gunther; and Grosch, Gerhard, 4,100,507, Cl. 331-94.50G.

Service Equipment Design Co., Inc.: *See—*
Hauk, Ernest D., 4,099,429, Cl. 81-57.170.
Hauk, Thomas D.; and Hauk, Ernest D., 4,099,405, Cl. 73-46.000.

Servimetal: *See—*
Beguin, Jean Claude; and Guerit, Pierre, 4,099,965, Cl. 75-68.00R.

Setter, Alfred C.: *See—*
Olafson, Arland I.; and Setter, Alfred C., 4,100,596, Cl. 363-148.000.

Shaeffer, Raymond P., to Hobart Corporation. Food processing apparatus. 4,100,613, Cl. 366-143.000.

Shaeffer, Raymond P.: *See—*
Hoover, Richard D.; Shaeffer, Raymond P.; and Brackman, Donald A., 4,100,612, Cl. 366-143.000.

Shaffer, Roy E., to United States of America, Army. Composition for screening infra-red radiation. 4,100,102, Cl. 252-305.000.

Shaffer, Walter M., to Caterpillar Tractor Co. Blocking valve for power steering for lift trucks. 4,099,378, Cl. 60-413.000.

Shandon Southern Products Limited: *See—*
Henderson, Kenneth James, 4,099,483, Cl. 118-49.100.

Shapiro, Ascher H., to Massachusetts Institute of Technology. Recipe conversion calculator. 4,100,602, Cl. 364-715.000.

Sharma, Mahindar N.: *See—*
White, Eugene B.; and Sharma, Mahindar N., 4,100,070, Cl. 210-136.000.

Sharp, Dennis J. Door hinges. 4,099,347, Cl. 49-399.000.

Sharp, Herbert John: *See—*
Shead, Terence Humphrey Charles; Hart, Frederick Leslie; and Sharp, Herbert John, 4,100,247, Cl. 264-271.000.

Sharpe, Andrew Jackson, Jr.: *See—*
Sinkovitz, Gloria DiMarco; and Sharpe, Andrew Jackson, Jr., 4,100,079, Cl. 252-8.55C.

Shaw, Eugene Douglas, to Ortho Diagnostics Inc. Method of detecting hepatitis B core antigen and antibody. 4,100,267, Cl. 424-1.000.

Shead, Terence Humphrey Charles; Hart, Frederick Leslie; and Sharp, Herbert John, to GKN Sankey Limited. Method of manufacturing a disc wheel. 4,100,247, Cl. 264-271.000.

Sheahan, Dorothy Marie: *See—*
Sheahan, Ray Albert; and Sheahan, Dorothy Marie, 4,099,672, Cl. 239-317.000.

Sheahan, Ray Albert; and Sheahan, Dorothy Marie. Shower-head fixture. 4,099,672, Cl. 239-317.000.

Sheely, Clyde Q., Jr.; and Baldwin, David E., Jr., to Continental Oil Company. Single well tracer method to evaluate enhanced recovery. 4,099,565, Cl. 166-252.000.

Shell Oil Company: *See—*
Bull, Michael J.; and Searle, Robert J. G., 4,100,363, Cl. 560-255.000.
Davis, Royston H.; and Searle, Robert J. G., 4,100,298, Cl. 424-304.000.
Pilgram, Kurt H. G., 4,099,956, Cl. 71-120.000.

Shen, John: *See—*
Johnson, Clarence A.; and Shen, John, 4,099,933, Cl. 48-202.000.

Shepard, David: *See—*
Fischman, Kurt; Offer, Robert; Rudner, Bernard; and Shepard, David, 4,099,943, Cl. 55-487.000.

Sherman, Michael I., to Kamyr, Inc. Two-stage pulp thickening. 4,100,069, Cl. 210-109.000.

Sherritt Gordon Mines Limited: *See—*
Swinkels, Godefridus M., 4,100,250, Cl. 423-34.000.

Shetty, Bola Vithal, to Pennwalt Corporation. Anorectic adamantane derivatives and method of using the same. 4,100,170, Cl. 424-325.000.

Shields, James E., to Eli Lilly and Company. Somatostatin analogs and intermediates thereto. 4,100,117, Cl. 260-8.000.

Shier, George D.: *See—*
Bozzelli, John W.; Bremer, Donald N.; and Shier, George D., 4,100,256, Cl. 423-220.000.

Shifflet, Glynne W., Jr., to Tuthill Corporation. Electronic security system. 4,100,534, Cl. 340-149.00A.

Shiina, Akira. Mudguard for a vehicle. 4,099,736, Cl. 280-154.50R.

Shimizu, Shinichi: *See—*
Yanagioka, Hiroshi; Shimizu, Shinichi; and Tamura, Kouichi, 4,099,925, Cl. 23-285.000.

Shimizu, Tatsuo: *See—*
Somezawa, Masashi; Higuchi, Shigetaka; Shimizu, Tatsuo; and Ishibashi, Isao, 4,100,326, Cl. 427-130.000.

Shin Nippon Kinzoku Co., Ltd.: *See—*
Isono, Nobujiro, 4,099,346, Cl. 49-82.000.

Shinko Industries Co., Ltd.: *See—*
Muto, Teruhide, 4,099,433, Cl. 83-155.000.

Shinn, Robert C., Jr., to Hollyford Enterprises, Inc. Trailer safety stand. 4,099,695, Cl. 248-351.000.

Shinomura, Toshihiko, to Nippon Oil Company, Ltd. Process for producing permeable membranes. 4,100,238, Cl. 264-49.000.

Shinozaki, Mamoru; Takahama, Yuichi; Tubaki, Hachiro; Nagasawa, Kazuo; and Mikami, Yasao, to Tanita Corporation. Hand sweeper for carpets. 4,099,284, Cl. 15-42.000.

Shorrock, James C.: *See—*
Brasey, Marcel; Schweizer, Alfred D.; and Shorrock, James C., 4,100,341, Cl. 536-56.000.

Shosakai, Shigemasa: *See—*
Ohashi, Tamaki; Shosakai, Shigemasa; Yamagishi, Shohei; and Taniguchi, Kunihiro, 4,099,421, Cl. 74-10.330.

Shultz, Edmond Franklin, Jr.: *See—*
Lemke, Timothy Allen; and Shultz, Edmond Franklin, Jr., 4,099,615, Cl. 206-329.000.
Shuman, Jack N. Table for plastic forming apparatus. 4,099,901, Cl. 425-388.000.
Shwartzman, Stanley, to RCA Corporation. Method and apparatus for detecting ultrasonic energy. 4,099,417, Cl. 73-606.000.
Siefert, Eckhard: *See—*
Reinke, Friedhelm; Mackenberger, Ludwig; and Siefert, Eckhard, 4,100,387, Cl. 219-10.570.
Siemens Aktiengesellschaft: *See—*
Baues, Peter; and Plaettner, Rolf, 4,099,836, Cl. 350-96.140.
Diepers, Heinrich, 4,099,986, Cl. 136-89.0TF.
Elmqvist, Rune; and Almgren, Bertil, 4,100,550, Cl. 346-140.00R.
Goetzl, Horst; Grassme, Ulrich; and Seissl, Johannes, 4,100,417, Cl. 250-505.000.
Kontsch, Otmar; and Schmidt, Fritz, 4,099,746, Cl. 285-119.000.
Krause, Gerhard, 4,100,423, Cl. 250-551.000.
Sierracin Corporation, The: *See—*
Levin, Berton P., 4,100,398, Cl. 219-541.000.
Sigma-Tau: *See—*
Cavazza, Claudio, 4,100,289, Cl. 424-266.000.
Silverblatt, Bernard L., to Westinghouse Electric Corp. Nuclear reactor vessel and internals alignment apparatus. 4,100,021, Cl. 176-87.000.
Silvestri, George J., Jr., to Westinghouse Electric Corp. Extended fuel cycle operation for pressurized water reactor plants. 4,099,385, Cl. 60-678.000.
Silvus, H. Stanley, Jr.: *See—*
Newman, Francis Marion, Jr.; and Silvus, H. Stanley, Jr., 4,100,491, Cl. 324-204.000.
Simone, Giovanni. Junction device for tridimensionally extending trussed structures. 4,099,888, Cl. 403-172.000.
Sims, Malcolm Leslie: *See—*
Brown, David Emmerson; Clark, John Trevor Kent; McCarroll, John James; and Sims, Malcolm Leslie, 4,099,990, Cl. 148-6.350.
Singelmann, Dietrich; Strobl, Heinrich; and Munding, German, to Messerschmitt-Bolkow-Blohm GmbH. Pressure differential piston-combustion chamber system. 4,099,445, Cl. 89-7.000.
Singer Company, The: *See—*
Schroeder, George Francis, 4,100,466, Cl. 318-102.000.
Singh, Tej Kuldip, to Associated Paper Industries Limited. Footwear. 4,099,342, Cl. 36-44.000.
Sinkovitz, Gloria DiMarco; and Sharpe, Andrew Jackson, Jr., to Calgon Corporation. Polymers for acid thickening. 4,100,079, Cl. 252-8.55C.
Sivachenko, Eugene W. High strength corrugated metal plate and method of fabricating same. 4,099,359, Cl. 52-630.000.
Skarud, Bengt Olof Roland: *See—*
Margen, Peter Heinrich Erwin; Bosaeus, Jan Anders; and Skarud, Bengt Olof Roland, 4,099,555, Cl. 165-55.000.
SKF Industrial Trading & Development Company B.V.: *See—*
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Skolaude, Werner, to Linde Aktiengesellschaft. Efficient air fractionation. 4,099,945, Cl. 62-30.000.
Skrivseth, Robert K., to SolaRay, Inc. Solar heating collector. 4,099,513, Cl. 126-270.000.
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Slocum, Charles W., to Sealed Unit Parts Co., Inc. Electric motor control and method. 4,100,468, Cl. 318-221.00C.
Smathers, Donald Lee, to Du Pont de Nemours, E. I., and Company. Process for making lower alkyl formates. 4,100,360, Cl. 560-232.000.
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Smith, Jimmy B.; and Haley, Jack R., to Peabody Coal Company. Quenching method. 4,100,034, Cl. 201-39.000.
Smith, Joseph Leland, to RCA Corporation. Eccentric convergence apparatus for in-line beam cathode ray tubes. 4,100,518, Cl. 335-212.000.
Smith, Kenneth E.; and Myer, Floyd L., to Sperry Rand Corporation. Tongue-mounted assembly for supporting an implement driveline. 4,099,594, Cl. 180-14.00B.
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Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Hoefke, Wolfgang; and Kohn, Franz Josef, to Boehringer Ingelheim GmbH. 2-[N-phenyl-N-(cycloalkyl-methyl)-amino]-2-imidazolines and salts thereof. 4,100,292, Cl. 424-273.00R.
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Standley, Wendell Evert, to Abbott Laboratories. Nozzle member for a container washing apparatus. 4,099,674, Cl. 239-431.000.
Stange, Klaus K., to Xerox Corporation. Upright document carousel. 4,099,810, Cl. 312-183.000.
Stapp, Paul R., to Phillips Petroleum Company. Oxidation process. 4,100,362, Cl. 560-246.000.
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Stevens, John L. Hinged bulldozer blade. 4,099,578, Cl. 172-802.000.
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Stillman, Neil W., to Diamond Shamrock Corporation. Electrolytic generation of halogen biocides. 4,100,052, Cl. 204-268.000.
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Straayer, Ronald Jack, to Harris Corporation. Flat field optical scanning system. 4,099,829, Cl. 350-6.100.
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Sturm, Ronald Leo; and Smith, James Curtis, to Oxford Laboratories Inc. Hand-held pipette for repetitively dispensing precise volumes of liquid. 4,099,548, Cl. 141-27.000.
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Sunahara, Hiroshi; Ishihara, Yutaka; Tanaka, Kazuhiko; and Morimoto, Yuko, to Agency of Industrial Science and Technology; and Yanagimoto Manufacturing Co., Ltd. Method and apparatus for determination of activated sludge volume index. 4,099,871, Cl. 356-73.000.
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Swanson, Everts W.; and Wehrman, Marvin D., to Boeing Company, The. Boundary layer control system for aircraft. 4,099,691, Cl. 244-207.000.
Sweet, David L.: *See—*
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,099,741, Cl. 280-712.000.
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., to American Carrier Equipment, Inc. Supplemental air spring assembly. 4,099,741, Cl. 280-712.000.
Swinkels, Godefridus M., to Cominco Ltd.; and Sherritt Gordon Mines Limited. Selective precipitation of copper chlorides from aqueous solutions with unsaturated aliphatic hydrocarbons. 4,100,250, Cl. 423-34.000.
Swish Products Limited: *See—*
Cox, Terence Allan; and Lewis, David Roger, 4,099,815, Cl. 312-330.00R.
Syntex (U.S.A.) Inc.: *See—*
Nelson, Peter H.; and Untch, Karl G., 4,100,174, Cl. 260-340.90R.
Syrkov, Anatoly Borisovich: *See—*
Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Schedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich, 4,099,334, Cl. 33-346.000.
Systron-Donner Corporation: *See—*
Hartzell, Robert Eugene, Jr., 4,099,415, Cl. 73-497.000.
Szauer, Jorge S.: *See—*
Baylis, Shelby M.; and Szauer, Jorge S., 4,099,518, Cl. 128-2.00B.
Tabakov, Vladimir Pavlovich: *See—*
Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.
Tabata, Norikazu; Ueno, Takanori; and Namba, Keisuke, to Mitsubishi Denki Kabushiki Kaisha. Ozone-generating apparatus. 4,100,421, Cl. 250-533.000.
Taber, Gilbert L. Method of skinning small animals. 4,099,294, Cl. 17-50.000.
Tabourier, Remy, to Thomson-CSF. Missile guidance system. 4,100,545, Cl. 343-7.0ED.
Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., to Nalco Chemical Company. Process for making phosphate esters and products thereof. 4,100,231, Cl. 260-978.000.
Taiheiyo Engineering Incorporated: *See—*
Nakajima, Shigeo; and Endo, Hajime, 4,099,786, Cl. 299-43.000.
Sawayama, Isao; and Endo, Hajime, 4,099,781, Cl. 299-1.000.
Tait, Robert J., to Littelfuse, Inc. Method for making plug-in fuse assemblies. 4,099,322, Cl. 29-623.000.
Tajima, Akira: *See—*
Kawamura, Naoto; Tajima, Akira; and Tanaka, Katumi, 4,099,846, Cl. 350-186.000.
Takahama, Yuichi: *See—*
Shinozaki, Mamoru; Takahama, Yuichi; Tubaki, Hachiro; Nagasawa, Kazuo; and Mikami, Yasao, 4,099,284, Cl. 15-42.000.
Takahashi, Akinori, to Nippon Electric Co., Ltd. Photoelectric conversion circuit. 4,100,407, Cl. 250-214.00P.
Takahashi, Koji: *See—*
Akimoto, Taizo; Terashita, Takaaki; Takahashi, Koji; Watanabe, Shigeru; and Asai, Eiichi, 4,100,424, Cl. 250-559.000.
Takahatake, Yuriko: *See—*
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Takano, Hideo; Saito, Satoshi; Sato, Tadashi; Yamaguchi, Tuyoshi; and

Narita, Yoshihiro, to Hitachi Cable, Ltd. Apparatus for producing foamed plastic insulated wires. 4,099,897, Cl. 425-4.00C.
Takata, Yataro: *See*—
Horikawa, Masayuki; Takata, Yataro; and Sumiyoshi, Kikuo, 4,100,245, Cl. 264-211.000.
Takatori, Yasushi: *See*—
Muto, Hakaru; Kurabayashi, Sadasuke; Takatori, Yasushi; Yamaguchi, Isao; and Watanabe, Asao, 4,100,552, Cl. 346-162.000.
Takayama, Hiroshi; and Aizawa, Tatsuo, to Mita Industrial Co. Ltd. Pressure-fixing magnetic developer containing hydrogenated polystyrene binder for electrostatic photography and process for preparation thereof. 4,100,087, Cl. 252-62.10P.
Takeda Chemical Industries, Ltd.: *See*—
Fujino, Masahiko; Nishimura, Osamu; Nagawa, Yuji; and Fukuda, Naohisa, 4,100,152, Cl. 260-112.5TR.
Tatsumi, Tetsujiro; Miyamoto, Reiji; Narasaki, Shiro; Kazama, Seiji; and Tanaka, Michio, 4,099,638, Cl. 215-12.00R.
Takeshita, Hiroshi: *See*—
Uchida, Shoji; Takeshita, Hiroshi; and Yamazaki, Shozo, 4,100,072, Cl. 210-242.00S.
Takesi, Kunio; and Tanaka, Kazuo, to Canon Kabushiki Kaisha. Zoom lens with aberration variation prevented for focusing. 4,099,845, Cl. 350-184.000.
Talley, Jay D.: *See*—
Slack, Donald J.; and Talley, Jay D., 4,100,581, Cl. 360-12.000.
Tam, Richard K., to Burroughs Corporation. Fully regulated temperature compensated voltage regulator. 4,100,477, Cl. 323-19.000.
Tam, Richard K., to Burroughs Corporation. Monolithic regulator for CML devices. 4,100,478, Cl. 323-19.000.
Tamoni, Giorgio: *See*—
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Tamura, Kouichi: *See*—
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Tanaka, Akira: *See*—
Hasegawa, Junzo; Hayashi, Yasutaka; Suzuki, Yasuhiko; Katoh, Takashi; Tsunekawa, Takahiko; and Tanaka, Akira, 4,099,297, Cl. 19-240.000.
Tanaka, Jinkichi; Watanabe, Itaru; and Suzuki, Motoaki, to Nippon Kokan Kabushiki Kaisha. Method of high speed gas shielded arc welding. 4,100,389, Cl. 219-74.000.
Tanaka, Katumi: *See*—
Kawamura, Naoto; Tajima, Akira; and Tanaka, Katumi, 4,099,846, Cl. 350-186.000.
Tanaka, Kazuhiko: *See*—
Sunahara, Hiroshi; Ishihara, Yutaka; Tanaka, Kazuhiko; and Morimoto, Yuko, 4,099,871, Cl. 356-73.000.
Tanaka, Kazuo: *See*—
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Tanaka, Michio: *See*—
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Tanczyn, Harry: *See*—
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Taniguchi, Kunihiro: *See*—
Ohashi, Tamaki; Shosakai, Shigemasa; Yamagishi, Shohei; and Taniguchi, Kunihiro, 4,099,421, Cl. 74-10.330.
Tanita Corporation: *See*—
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Tano, Eiichi: *See*—
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Tarancon, Gregorio, to Union Carbide Corporation. Process for the purification of silane. 4,099,936, Cl. 55-75.000.
Tatsumi, Tetsujiro; Miyamoto, Reiji; Narasaki, Shiro; Kazama, Seiji; and Tanaka, Michio, to Mitsui Polychemicals, Co., Ltd.; and Takeda Chemical Industries, Ltd. Coated glass bottles. 4,099,638, Cl. 215-12.00R.
Taylor, James L.: *See*—
Maier, Roger F.; Milligan, Jimmy L.; Bahnfleth, William A.; and Taylor, James L., 4,099,763, Cl. 296-28.00C.
Taylor Medical Oxygen Services, Inc.: *See*—
Carlson, Peter B., 4,100,537, Cl. 340-626.000.
Technam, Inc.: *See*—
Scherr, George H., 4,100,268, Cl. 424-12.000.
Technicon Instruments Corporation: *See*—
Kim, Young Ran, 4,099,917, Cl. 23-230.00B.
Teijin, Limited: *See*—
Ichikawa, Yataro; Suzuki, Nobuo; and Sawaki, Toru, 4,100,180, Cl. 260-347.800.
Telex Computer Products, Inc.: *See*—
Pittman, John B., 4,099,601, Cl. 188-163.000.
Temperley, Harry Davison; and Parsons, David, to Automotive Products Limited. Disc brake assembly. 4,099,600, Cl. 188-73.400.
Temple, Fred, to Westinghouse Air Brake Company. Double handle self-locking mechanism for manual operation of a cock key. 4,099,702, Cl. 251-95.000.
Tennant Company: *See*—
Christensen, Bryan L.; Sampson, William J.; Brogger, Ronald L.; and Lee, Jeffrey A., 4,099,285, Cl. 15-83.000.
Tenneco Chemicals, Inc.: *See*—
Fischman, Kurt; Offer, Robert; Rudner, Bernard; and Shepard, David, 4,099,943, Cl. 55-487.000.
Terashita, Takaaki: *See*—
Akimoto, Taizo; Terashita, Takaaki; Takahashi, Koji; Watanabe, Shigeru; and Asai, Eiichi, 4,100,424, Cl. 250-559.000.
Terry, Ruel Carlton, to In Situ Technology, Inc. Generating medium BTU gas from coal in situ. 4,099,567, Cl. 166-261.000.
Tesei, Renato: *See*—
Romano, Ugo; and Tesei, Renato, 4,100,351, Cl. 560-24.000.
Texaco Development Corporation: *See*—
Child, Edward T., 4,099,932, Cl. 48-197.00R.
Texaco Exploration Canada Ltd.: *See*—
Redford, David A., 4,099,566, Cl. 166-260.000.
Texaco Inc.: *See*—
Allen, Joseph C., 4,099,568, Cl. 166-269.000.
Bousaid, Issam S., 4,099,569, Cl. 166-273.000.
Kalfoglou, George; and Flournoy, Kenoth H., 4,099,537, Cl. 137-13.000.
Larkin, John M.; and Chafetz, Harry, 4,100,086, Cl. 252-50.000.
Miller, Gordon H., 4,100,147, Cl. 528-362.000.
Paull, Peter L.; and McGann, Rodney, 4,099,382, Cl. 60-648.000.
Paull, Peter L.; and McGann, Rodney, 4,099,383, Cl. 60-648.000.
Powell, Justin C., 4,100,091, Cl. 252-70.000.
Powers, William J., III, 4,100,084, Cl. 252-39.000.
Savoit, Robert E.; and Henry, Clemence J., 4,099,915, Cl. 21-60.50A.
Thompson, Larry W.; Bridges, James R.; and Fuchs, James A., 4,100,483, Cl. 324-6.000.
Texas Instruments Incorporated: *See*—
Brantingham, George Lawrence, 4,100,606, Cl. 364-900.000.
den Brinker, Carl S.; and Nicholls, Keith David, 4,100,530, Cl. 340-53.000.
Miles, Larry L., 4,100,600, Cl. 364-710.000.
Thai, Nguyen Dang: *See*—
Yamashita, Mitsura; Hirano, Kousaku; and Thai, Nguyen Dang, 4,100,482, Cl. 324-6.000.
Thaxter, James B.: *See*—
McMahon, Donald H.; and Thaxter, James B., 4,099,875, Cl. 356-103.000.
Theimer, Ernst Theodore; and Bissett, Robert Stuart, to Lectrofood, Corp. Electrical resistance cooking appliance for use with an electrode type cooking package. 4,099,454, Cl. 99-358.000.
Theimer, Ernst Theodore; and Heinze, George E., to Lectrofood Corp. Container for electrical resistance cooking. 4,100,302, Cl. 426-90.000.
Thierer, Georg; and Dolinsek, Hans, to Johannes Fuchs, Firma. Scraper. 4,099,631, Cl. 214-10.000.
Thillays, Jacques Claude, to U.S. Philips Corporation. Light conductor in a signal isolator. 4,100,422, Cl. 250-551.000.
Thomas C. Wilson, Inc.: *See*—
Schott, Donald E., 4,099,400, Cl. 72-122.000.
Thomas, John Stuart, to Fibreglass Limited. Bushing for processing molten glass. 4,099,948, Cl. 65-1.000.
Thompson, Charles D.: *See*—
MacRae, Donald R.; Gold, Richard G.; Sandall, William R.; and Thompson, Charles D., 4,099,958, Cl. 75-0.5BA.
Thompson, James W., to Hobart Corporation. Food processing apparatus. 4,100,615, Cl. 366-169.000.
Thompson, Larry W.; Bridges, James R.; and Fuchs, James A., to Texaco Inc. Dielectric well logging system and method with error correction. 4,100,483, Cl. 324-6.000.
Thomsen, Jack W., to Weckesser Company, Inc. Captive standoff connector. 4,100,368, Cl. 174-138.00D.
Thomson-CSF: *See*—
Felix, Pierre, 4,100,574, Cl. 358-113.000.
Hareng, Michel; and Le Berre, Serge, 4,099,857, Cl. 350-351.000.
Tabourier, Remy, 4,100,545, Cl. 343-7.0ED.
Thorn Electrical Industries Limited: *See*—
Gould, Allan Victor Stewart, 4,100,594, Cl. 362-308.000.
Thornwald, Everett D., to Aerwey Laboratories, Inc. Humidifier-nebulizer apparatus. 4,100,235, Cl. 261-142.000.
Threatt, James W. Expandable shaft. 4,099,732, Cl. 279-2.00A.
Tilp, George E., to Adams Industries, Inc. Electric water heater and hot water dispenser. 4,100,394, Cl. 219-296.000.
Tingley, John Ronald: *See*—
Napolitano, Orlando; Reid, Robert Edward; Saltzberg, Burton R.; Stochel, Nathan Harold; and Tingley, John Ronald, 4,100,533, Cl. 340-147.00R.
Tippmer, Kurt; Schmitt, Hubert; Vinke, Heinrich; and Abendroth, Georg, to Carl Still Recklinghausen, Firma. Method of removing ash components from high-ash content coals. 4,099,929, Cl. 44-1.00F.
Tobe, Akihiro: *See*—
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,100,299, Cl. 424-330.000.
Tocquet, Bernard, to Etat Francais. Multi-driver piezoelectric transducers with single counter-masses, and sonar antennas made therefrom. 4,100,527, Cl. 340-10.000.
Toho Ganryo Kogyo Co., Ltd.: *See*—
Abe, Nobuyoshi; Kubo, Shigenaga; and Kanamaru, Kiyoshi, 4,100,074, Cl. 252-8.100.
Tokuyama Sekisui Kogyo Kabushiki Kaisha: *See*—
Iwamoto, Kyoichi; and Kakei, Hiroshi, 4,100,222, Cl. 260-837.0PV.
Toleikis, John, Jr., to United States Steel Corporation. Process for heat-treating the head of railroad rail. 4,099,996, Cl. 148-131.000.

Tolles, William M.: *See*—
Decker, Donald L.; and Tolles, William M., 4,099,854, Cl. 350-312.000.
Tolley, Bryan Peter: *See*—
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Tomita, Yoshifumi: *See*—
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Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,100,299, Cl. 424-330.000.
Toome, Edward James, to Elliott Brothers (London) Limited. Support apparatus. 4,099,696, Cl. 248-358.00R.
Toray Silicone Company, Ltd.: *See*—
Ichikawa, Kunihiro; Mie, Terumi; and Ona, Isao, 4,100,124, Cl. 260-29.20M.
Torres, Jean-Pierre: *See*—
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Tosswill, Christopher H., to Galileo Electro-Optics Corp. Non-uniform fiber optic imaging system. 4,099,833, Cl. 350-96.250.
Townsend, Richard E. Floatable pole marker beacon. 4,099,282, Cl. 9-8.30E.
Toy, Arthur D. F.: *See*—
Uhing, Eugene H.; and Toy, Arthur D. F., 4,100,230, Cl. 260-972.000.
Toyo Chuo Kagaku Kenkyusho: *See*—
Kimura, Shozo; and Yoshida, Hidetoshi, 4,100,041, Cl. 204-58.000.
Toyoda Koki Kabushiki-Kaisha: *See*—
Asano, Hiroaki, 4,099,349, Cl. 51-101.00R.
Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,099,934, Cl. 51-295.000.
Toyonaka Kosakusho Co., Ltd.: *See*—
Muto, Teruhide, 4,099,433, Cl. 83-155.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Mori, Mamoru; Yasumatsu, Jun; and Kubota, Tatsushi, 4,099,684, Cl. 242-107.000.
Nogami, Tomoyuki; and Ohta, Takaaki, 4,099,791, Cl. 303-24.00F.
Noguchi, Yoshikazu; Senda, Katsuyuki; and Kobashi, Mamoru, 4,099,508, Cl. 123-148.0DC.
Yasuda, Eturo; Sato, Susumu; Segawa, Yoshihiro; Hattori, Tadashi; and Aoki, Keiji, 4,099,922, Cl. 23-254.00E.
Tracy, Thomas Ray. Escape device. 4,099,595, Cl. 182-48.000.
Tracy, Thomas Ray. Escape device. 4,099,596, Cl. 182-48.000.
Trans Research Development Corporation: *See*—
Williams, James R., 4,099,589, Cl. 180-65.00A.
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Vanden Broek, Jan A.; and Carney, James A., 4,099,881, Cl. 356-171.000.
Treiber, Helmut: *See*—
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Breuer, Hermann; and Treuner, Uwe D., 4,100,345, Cl. 544-21.000.
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Luc, Andre R., 4,099,304, Cl. 24-274.00R.
Trisler, Jerry V.: *See*—
Boyer, Harold E.; and Trisler, Jerry V., 4,099,710, Cl. 270-68.00A.
Troxler, Eduard: *See*—
Peter, Heinz; Reinehr, Dieter; and Troxler, Eduard, 4,100,111, Cl. 528-116.000.
Trunnell, Harold K. Curved metal clamp plate. 4,099,788, Cl. 301-105.00R.
Trusch, Kenneth Paul, to Western Electric Company, Inc. Method of and apparatus for preforming metal overlap edge with overlap die. 4,100,003, Cl. 156-54.000.
TRW Inc.: *See*—
Coffman, Jerry L., 4,099,893, Cl. 417-300.000.
Tsang, Won-Tien: *See*—
Cho, Alfred Yi; and Tsang, Won-Tien, 4,099,305, Cl. 29-579.000.
Tschantre, Walter, to Von Roll AG. Combustion of refuse containing chlorinated hydrocarbons. 4,100,255, Cl. 423-210.000.
Tsui, Frank; and Tsui, Katherine, to International Business Machines Corporation. Addressing of gas discharge display devices. 4,100,447, Cl. 313-217.000.
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Tsui, Frank; and Tsui, Katherine, 4,100,447, Cl. 313-217.000.
Tsunekawa, Takahiko: *See*—
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Tsuzuki, Akira: *See*—
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Tubaki, Hachiro: *See*—
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Tucker, Paul T.: *See*—
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Tunemoto, Daiei: *See*—
Kondo, Kiyoshi; Tunemoto, Daiei; Sugimoto, Kikuo; and Takahatake, Yuriko, 4,100,184, Cl. 260-464.000.
Tuss, John Joseph: *See*—
Bell, Frederick Koonce; and Tuss, John Joseph, 4,099,800, Cl. 308-6.00R.
Tuthill Corporation: *See*—
Shifflet, Glynne W., Jr., 4,100,534, Cl. 340-149.00A.
Tutt, Eugene F.; and Tutt, Rita C. Calorie calculator-chronometer. 4,100,401, Cl. 235-92.00T.
Tutt, Rita C.: *See*—
Tutt, Eugene F.; and Tutt, Rita C., 4,100,401, Cl. 235-92.00T.
Uba, Toshio: *See*—
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,099,401, Cl. 72-147.000.
Uchida, Shoji; Takeshita, Hiroshi; and Yamazaki, Shozo, to Mitsubishi Jukogyo Kabushiki Kaisha. Effluent oil collecting vessel. 4,100,072, Cl. 210-242.00S.
Uchida, Tadahiro, to Kabushiki Kaisha Kubota Seisakusho. Apparatus for preventing vibration in a centrifugal separator. 4,099,667, Cl. 233-24.000.
Uchigasaki, Isao: *See*—
Maekawa, Iwao; Uchigasaki, Isao; and Kumazaki, Sakato, 4,100,120, Cl. 260-22.0CB.
Uchiyama, Takashi: *See*—
Nakamura, Zenzo; Ohtaki, Syohei; Tsunekawa, Tokuichi; Ito, Tadashi; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,100,459, Cl. 315-136.000.
Ueno, Takanori: *See*—
Tabata, Norikazu; Ueno, Takanori; and Namba, Keisuke, 4,100,421, Cl. 250-533.000.
Ueno, Yukichi; and Nakata, Toshiaki, to Hitachi, Ltd. Apparatus for selecting the field of view of a sample. 4,100,410, Cl. 250-311.000.
Ufholz, Heinrich: *See*—
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Ufken, Gregory Allen; and Ruopsa, Jon Arthur, to Donaldson Company, Inc. Automatic dumping roof drill dust collector. 4,099,937, Cl. 55-212.000.
Uhing, Eugene H.; and Toy, Arthur D. F., to Stauffer Chemical Company. Process for preparing mono- and disubstituted mercapto-phosphorothionochloridates. 4,100,230, Cl. 260-972.000.
Ulrich, Michael Henry: *See*—
Jones, Rick Owen; and Ulrich, Michael Henry, 4,099,866, Cl. 355-58.000.
Umiastowski, John. Twisted core yarn. 4,099,370, Cl. 57-144.000.
Union Carbide Corporation: *See*—
Dougherty, Steve John; and Garska, Kenneth Joseph, 4,100,253, Cl. 423-87.000.
D'Silva, Themistocles D. J., 4,100,295, Cl. 424-278.000.
Dunks, Gary Burr; and Ordonez, Kathy Palmer, 4,100,199, Cl. 260-606.50B.
Hodakowski, Leonard Edward; and Osborn, Claiborn Lee, 4,100,046, Cl. 204-159.230.
Levine, Isaac Jacob; and Karol, Frederick John, 4,100,105, Cl. 252-429.00R.
Mui, Jeffrey Y. P.; and Kanner, Bernard, 4,100,172, Cl. 260-327.00H.
Mui, Jeffrey Yick-Pui; and Pines, Arthur Noah, 4,099,981, Cl. 106-308.00Q.
Noshay, Allen; and Karol, Frederick John, 4,100,337, Cl. 526-130.000.
Tarancon, Gregorio, 4,099,936, Cl. 55-75.000.
Walter, Andrew Tainter; Bryant, George Macon; and Readshaw, Ronald Louis, 4,099,913, Cl. 8-173.000.
Uniroyal, Inc.: *See*—
Martin, Frank Stephen; Melvin, Terence; and Pieroni, Joseph Kirby, 4,100,182, Cl. 260-429.900.
United Kingdom Atomic Energy Authority: *See*—
Gale, George Martin, 4,100,064, Cl. 210-23.00H.
United States of America
Air Force: *See*—
Griffin, William W., Jr.; and Pierce, Robert M., 4,099,373, Cl. 60-39.670.
Hussey, Charles L.; Nardi, John C.; Fannin, Armand A., Jr.; King, Lowell A.; and Erbacher, John K., 4,100,044, Cl. 204-146.000.
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Campbell, Donn V.; and Paragi, Edward J., 4,100,546, Cl. 343-708.000.
Laible, Roy C.; and Brynjolfsson, Ari, 4,099,726, Cl. 277-1.000.
Russell, William J., 4,100,015, Cl. 156-665.000.
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Westervelt, Rudy G.: *See*—
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Westinghouse Air Brake Company: *See*—
Kolkman, Dick J., 4,099,692, Cl. 246-34.0CT.
Mong, William K.; and Zoric, Michael T., 4,099,543, Cl. 137-625.220.
Temple, Fred, 4,099,702, Cl. 251-95.000.
Wright, Raymond C., 4,099,742, Cl. 280-714.000.
Westinghouse Electric Corp.: *See*—
Carr, Frank J., 4,099,591, Cl. 180-98.000.
Feilchenfeld, Michal M.; Daggett, Kenneth E.; and Lloyd, Raymond A., 4,099,668, Cl. 235-304.000.
Foster-Pegg, Richard W., 4,099,374, Cl. 60-39.120.
Gainer, Gordon C.; and Luck, Russell M., 4,099,805, Cl. 308-240.000.
Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, 4,100,264, Cl. 423-430.000.
Lange, Frederick F.; and Andersson, Clarence A., 4,099,979, Cl. 106-58.000.
Randall, Charles E., 4,099,599, Cl. 187-52.00R.
Silverblatt, Bernard L., 4,100,021, Cl. 176-87.000.
Silvestri, George J., Jr., 4,099,385, Cl. 60-678.000.
Smith, James D. B.; and Phillips, David C., 4,100,121, Cl. 260-23.0EP.
Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., 4,100,327, Cl. 428-339.000.
Westland Aircraft Limited: *See*—
Martin, Alfred Charles, 4,099,892, Cl. 416-134.00A.
Westley, John; and Liu, Chao-Min, to Hoffmann-La Roche Inc. New antibiotic X-14547. 4,100,171, Cl. 260-326.330.
Weston, Lance: *See*—
Stockdale, Roy; and Weston, Lance, 4,100,543, Cl. 340-521.000.
White, Eugene B.; and Sharma, Mahindar N., to Filters International, Inc. Apparatus for use in water purification particularly sewage treatments. 4,100,070, Cl. 210-136.000.
White, John U. Fluorescence spectrophotometer. 4,099,872, Cl. 356-85.000.
White Sewing Machine Company: *See*—
Hamlett, Sidney J.; and Bell, Charles M., 4,099,474, Cl. 112-258.000.
Whitehouse, Harper J.: *See*—
Alsup, James M.; and Whitehouse, Harper J., 4,100,498, Cl. 328-14.000.
Whitin Machine Works, Inc.: *See*—
Kieronski, John P.; Williams, Francis N.; and Smith, Leo J., 4,099,609, Cl. 198-395.000.
Whittle, Harry Reed; and Ward, Brooke Armitage, to A. J. Bingley Limited. Optical systems including polygonal mirrors rotatable about two axes. 4,099,830, Cl. 350-6.800.
Wiatt, James Gordon: *See*—
Nash, Myrwin William; Barry, John Kenneth; and Wiatt, James Gordon, 4,099,905, Cl. 425-589.000.
Wick, Helmut: *See*—
Merz, Herbert; Walther, Gerhard; Langbein, Adolf; Stockhaus, Klaus; and Wick, Helmut, 4,100,288, Cl. 424-260.000.
Wickes Corporation, The: *See*—
Kreucher, David L., 4,099,431, Cl. 82-9.000.
Wiechert, Rudolf: *See*—
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,026, Cl. 195-51.00G.
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,027, Cl. 195-51.00G.
Wiegeleben, Adalbert: *See*—
Weissflog, Wolfgang; Schubert, Hermann; Kresse, Horst; Wiegeleben, Adalbert; and Demus, Dietrich, 4,099,856, Cl. 350-350.000.
Wiese, Winfred John, to Borg-Warner Corporation. Mechanical seal assembly. 4,099,728, Cl. 277-96.000.
Wilbur, William T., to Progressive Machinery Corporation. Portable seam welder. 4,100,391, Cl. 219-81.000.
Wildforster, Heinrich: *See*—
Weirich, Walter; and Wildforster, Heinrich, 4,099,782, Cl. 299-1.000.
Wiley, Donald F., to Cosden Technology, Inc. Co-extrusion of ABS/-polystyrene multiple-layered sheeting. 4,100,237, Cl. 264-40.600.
Wilfert, Karl, deceased: *See*—
Schmid, Walter; Jambor, Arno; Wilfert, Karl, deceased; and Wilfert, Thomas, heir, 4,099,792, Cl. 303-113.000.
Wilfert, Thomas, heir: *See*—
Schmid, Walter; Jambor, Arno; Wilfert, Karl, deceased; and Wilfert, Thomas, heir, 4,099,792, Cl. 303-113.000.
Wilhelm, Gerhard: *See*—
Hockenberger, Lothar; Soyka, Manfred; and Wilhelm, Gerhard, 4,100,148, Cl. 528-374.000.
Williams, Alan: *See*—
Carter, David; Withnall, Malcolm; Williams, Alan; Redshaw, Digby Ralph; and Stevens, Richard William, 4,100,379, Cl. 179-147.00R.
Williams, Billy L.: *See*—
Burnham, Roger R.; Chapin, Merlin K.; Cook, David A.; Gilles, Theodore C.; and Williams, Billy L., 4,099,553, Cl. 165-22.000.
Williams, Francis N.: *See*—
Kieronski, John P.; Williams, Francis N.; and Smith, Leo J., 4,099,609, Cl. 198-395.000.
Williams, James R., to Trans Research Development Corporation. DC electric car with auxiliary power and AC drive motor. 4,099,589, Cl. 180-65.00A.
Williams, Joseph James: *See*—
Stiel, Donald Melvyn; Browski, Charles Robert; Neugroschel, Eric; and Williams, Joseph James, 4,100,598, Cl. 364-476.000.
Williamson, Warren L.: *See*—
Fathauer, George H.; Mathis, Cecil Ernest; and Williamson, Warren L., 4,100,497, Cl. 325-470.000.
Willinger, Allan H.: *See*—
Itakura, Tsuyoshi; and Willinger, Allan H., 4,099,544, Cl. 137-856.000.
Willis, Charles W. Fencing game set. 4,099,714, Cl. 273-1.00F.
Wilson Industries, Inc.: *See*—
Nelson, Paul M., 4,099,561, Cl. 166-55.100.
Wilson, William. Docking station. 4,100,616, Cl. 366-213.000.
Winiarski, Edward J.: *See*—
Bradbury, Christopher G.; Buchan, Walter; Winiarski, Edward J.; and Kropa, Gomer E., 4,099,900, Cl. 425-313.000.
Winkler, Hans-Georg: *See*—
Rode, Ernst-Dietrich; and Winkler, Hans-Georg, 4,100,036, Cl. 204-14.00R.
Wisbey, Philip Henry; and Elliot, George, to Marconi Company Limited, The. Liquid crystal display arrangements. 4,099,855, Cl. 350-333.000.
Wisbey, Philip Henry, to Marconi Company Limited, The. Delay line oscillator locked to a selected frequency of a chirp delay line. 4,100,511, Cl. 331-107.00A.
Wissinger, Waldemar; and Gauchel, Peter, to Dynamit Nobel Aktiengesellschaft. Process for the sizing of coextruded, multiple-layer extruded profiles from thermoplastic synthetic resins. 4,100,243, Cl. 264-171.000.
Wistinghausen, Nikolai K.; and Banninga, Edward P., to Fiberglas Canada Ltd. Apparatus for compressing and packaging articles. 4,099,363, Cl. 53-124.00D.
Withnall, Malcolm: *See*—
Carter, David; Withnall, Malcolm; Williams, Alan; Redshaw, Digby Ralph; and Stevens, Richard William, 4,100,379, Cl. 179-147.00R.
Wittenberg, Lester H. Process for preparing high purity lactose. 4,099,983, Cl. 127-63.000.
Wittke, James Pleister, to RCA Corporation. Semiconductor laser

having fundamental lateral mode selectivity. 4,100,508, Cl. 331-94.50H.
Wohler, Hans-Joachim; and Ilse, Walter, to Balcke-Durr AG. Sprinkler head for water spray cooling installations. 4,099,675, Cl. 239-498.000.
Wojcik, Bruce C.; Herrett, Wilfred H.; Cooper, Gerald D.; Goold, Reed; and Wojcik, Charles W., to Goold, Reed; Wojcik, Charles W.; Cooper, Gerald D.; and Herrett, Wilfred H. Process for electroaining metals from a metal-bearing solids slurry. 4,100,042, Cl. 204-105.00R.
Wojcik, Charles W.: *See—*
Wojcik, Bruce C.; Herrett, Wilfred H.; Cooper, Gerald D.; Goold, Reed; and Wojcik, Charles W., 4,100,042, Cl. 204-105.00R.
Wojtasinski, Ronald J.: *See—*
United States of America, National Aeronautics and Space Administration; Wojtasinski, Ronald J.; Fuchs, Jerry C.; and Grove, Charles H., 4,100,487, Cl. 324-96.000.
Wolak, Edward A. Tie pin. 4,099,300, Cl. 24-49.0CF.
Wolf, Gerhard Dieter; Schnoor, Werner; Voegele, Jean-Claude; Reinehr, Ulrich; and Nischk, Gunther, to Bayer Aktiengesellschaft. Filaments which may be cross-linked comprising at least 65% acrylonitrile and 0.5–10% N-methylol derivative of a urethane. 4,100,143, Cl. 526-301.000.
Wolfe, Eugene E.: *See—*
Heath, Allan B.; and Wolfe, Eugene E., 4,099,673, Cl. 239-415.000.
Wolfe, Robert W.: *See—*
Messier, Russell F.; and Wolfe, Robert W., 4,100,101, Cl. 252-301.40H.
Wolff, Egon E.: *See—*
Beckham, Joel M.; Easterling, Gene B.; Ringel, Reginald K.; and Wolff, Egon E., 4,099,577, Cl. 172-781.000.
Wolk, Ronald H.; Rovesti, William; and Maruhnic, Peter, to Hydrocarbon Research, Inc. Desulfurization of fuel gas at high temperature using supported molten metal carbonate absorbent. 4,100,107, Cl. 252-443.000.
Wolters, Gerhard, to Daimler-Benz Aktiengesellschaft. Seal of the upper area of a wet cylinder liner. 4,099,725, Cl. 277-1.000.
Woltersdorf, Otto W., Jr.: *See—*
Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Hoffman, William, 4,100,294, Cl. 424-275.000.
Woolvet, George Albert; and Tolley, Bryan Peter, to National Research Development Corp. Strain measurement. 4,099,411, Cl. 73-141.00R.
Woulbroun, John M.: *See—*
Francel, Josef; King, James E.; and Woulbroun, John M., 4,099,977, Cl. 106-53.000.
Wouters, Albert Paul, to AGFA-Gevaert N.V. Roller with adjustable length. 4,099,487, Cl. 118-651.000.
Woythaler, Saul L., to Raytheon Company. Pilot tone demodulator. 4,100,376, Cl. 179-15.0BP.
Woytiuk, Leo Victor; Mayer, Ronald Yves; and Kepes, George B., to Northern Telecom Limited. Method for producing powder filled cable. 4,100,002, Cl. 156-48.000.
Wright, Donald, to Imperial Chemical Industries Limited. Organic nitriles. 4,100,186, Cl. 260-465.80D.
Wright, Raymond C., to Westinghouse Air Brake Company. Control valve device for vehicle air springs. 4,099,742, Cl. 280-714.000.
Wu, Che-Kuang: *See—*
Bartholomew, Roger F.; and Wu, Che-Kuang, 4,099,978, Cl. 106-53.000.
Wutz, Max, to W. C. Heraeus GmbH. Electrical terminal, particularly plug-type terminal. 4,100,385, Cl. 200-268.000.
Xerox Corporation: *See—*
Buchheit, Robert F., 4,100,484, Cl. 324-32.000.
Burnham, Robert D.; and Scifres, Donald R., 4,099,999, Cl. 148-187.000.
Chu, Joseph Y.; and Schank, Richard L., 4,100,135, Cl. 528-11.000.
Davis, Thomas G., 4,100,411, Cl. 250-324.000.
Haas, Werner E. L.; and Dir, Gary A., 4,100,088, Cl. 252-62.520.
Jugle, Don B., 4,100,611, Cl. 366-139.000.
Leder, Lewis B., 4,099,969, Cl. 96-1.50R.
Marshall, Sidney W., 4,100,408, Cl. 250-230.000.
Perreault, Donald A., 4,100,604, Cl. 364-827.000.
Scouten, Charles G.; and Hamilton, Willard C., 4,099,968, Cl. 96-1.0SD.
Stange, Klaus K., 4,099,810, Cl. 312-183.000.
Yajima, Keiji: *See—*
Matsuzaki, Hideo; and Yajima, Keiji, 4,099,550, Cl. 141-51.000.
Yajima, Seishi; Hayashi, Josaburo; and Omori, Mamoru, to Research Institute for Iron, Steel and other Metals of the Tohoku University, The. Silicon carbide fibers having a high strength and a method for producing said fibers. 4,100,233, Cl. 423-345.000.
Yamada, Shigeru: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,099,438, Cl. 84-1.250.
Yamagishi, Hiroshi: *See—*
Ohsawa, Mitsuo; Onoe, Yukio; and Yamagishi, Hiroshi, 4,100,500, Cl. 329-103.000.
Yamagishi, Shohei: *See—*
Ohashi, Tamaki; Shosakai, Shigemasa; Yamagishi, Shohei; and Taniguchi, Kunihiro, 4,099,421, Cl. 74-10.330.
Yamaguchi, Akihiro: *See—*
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Yamaguchi, Isao: *See—*
Muto, Hakaru; Kurabayashi, Sadasuke; Takatori, Yasushi; Yamaguchi, Isao; and Watanabe, Asao, 4,100,552, Cl. 346-162.000.
Yamaguchi, Namio: *See—*
Akiyoshi, Tsuyoshi; Yamaguchi, Namio; and Yamamoto, Keisuke, 4,100,496, Cl. 325-369.000.
Yamaguchi, Tuyoshi: *See—*
Takano, Hideo; Saito, Satoshi; Sato, Tadashi; Yamaguchi, Tuyoshi; and Narita, Yoshihiro, 4,099,897, Cl. 425-4.00C.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Arimitsu, Tetsuya, 4,099,479, Cl. 115-41.00R.
Iio, Toshimitsu, 4,099,793, Cl. 303-116.000.
Yamamoto, Keisuke: *See—*
Akiyoshi, Tsuyoshi; Yamaguchi, Namio; and Yamamoto, Keisuke, 4,100,496, Cl. 325-369.000.
Yamamoto, Yukio; and Sakashita, Masami, to Yoshida Kogyo, K.K. Closure construction having adjustable catch assembly. 4,099,758, Cl. 292-341.180.
Yamashiro, Osamu, to Hitachi, Ltd. Class B FET amplifier circuit. 4,100,502, Cl. 330-264.000.
Yamashita, Mitsura; Hirano, Kousaku; and Thai, Nguyen Dang, to Mits-Co Geophysics Ltd. Method and apparatus for measuring ellipse parameters of electromagnetic polarization in geophysical exploration. 4,100,482, Cl. 324-6.000.
Yamazaki, Shozo: *See—*
Uchida, Shoji; Takeshita, Hiroshi; and Yamazaki, Shozo, 4,100,072, Cl. 210-242.00S.
Yanagimoto Manufacturing Co., Ltd.: *See—*
Sunahara, Hiroshi; Ishihara, Yutaka; Tanaka, Kazuhiko; and Morimoto, Yuko, 4,099,871, Cl. 356-73.000.
Yanagioka, Hiroshi; Shimizu, Shinichi; and Tamura, Kouichi, to Chiyoda Chemical Engineering & Construction Co., Ltd. Apparatus for desulfurization of flue gas. 4,099,925, Cl. 23-285.000.
Yankee, Ernest W., to Upjohn Company, The. 8β,12α-PGE$_2$-type compounds. 4,100,355, Cl. 560-121.000.
Yasuda, Eturo; Sato, Susumu; Segawa, Yoshihiro; Hattori, Tadashi; and Aoki, Keiji, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Gas component detection apparatus. 4,099,922, Cl. 23-254.00E.
Yasumatsu, Jun: *See—*
Mori, Mamoru; Yasumatsu, Jun; and Kubota, Tatsushi, 4,099,684, Cl. 242-107.000.
Yates, Jeffrey L. Tuning fork improvement. 4,099,443, Cl. 84-457.000.
Yates, William Harold: *See—*
Schaefer, Peter; Mason, Peter Alan; and Yates, William Harold, 4,100,142, Cl. 526-68.000.
Yatsuo, Tsutomu: *See—*
Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Konishi, Nobutake, 4,100,562, Cl. 357-19.000.
Yawata, Kazufumi: *See—*
Kobayakawa, Masaki; Yawata, Kazufumi; Ohta, Kazuo; and Kumazawa, Koichi, 4,100,456, Cl. 313-497.000.
Yax, Emile; and Abad, Aurelien, to Societe Chimique des Charbonnages. Method for the continuous manufacture of hydrocarbon resins. 4,100,336, Cl. 526-67.000.
Yokogawa Electric Works, Ltd.: *See—*
Ohte, Akira; and Imamura, Makoto, 4,099,413, Cl. 73-359.00R.
Yokono, Hitoshi: *See—*
Numata, Shun-ichi; Yokono, Hitoshi; and Mukai, Junji, 4,100,118, Cl. 260-18.0PT.
Yokota, Yukinaga: *See—*
Fukusaki, Hiroshi; Niki, Masao; and Yokota, Yukinaga, 4,100,127, Cl. 260-29.6NR.
Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Compound transistor circuitry. 4,100,438, Cl. 307-304.000.
York, Edward Robert: *See—*
Caricchio, Jerome Joseph, Jr.; and York, Edward Robert, 4,100,039, Cl. 204-43.00N.
Yoshida, Hidetoshi: *See—*
Kimura, Shozo; and Yoshida, Hidetoshi, 4,100,041, Cl. 204-58.000.
Yoshida, Kenji: *See—*
Sato, Yuzuru; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenji; and Oya, Tadanori, 4,099,972, Cl. 96-29.00D.
Yoshida Kogyo K.K.: *See—*
Fujisaki, Yoshinori, 4,099,301, Cl. 24-205.00R.
Kagoura, Tetsuro, 4,099,756, Cl. 292-336.300.
Yamamoto, Yukio; and Sakashita, Masami, 4,099,758, Cl. 292-341.180.
Yoshihara, Mitsuji: *See—*
Nagase, Hidenobu; Kishida, Eiji; and Yoshihara, Mitsuji, 4,099,496, Cl. 123-41.310.
Yoshimura, Kiyoharu; and Hayashi, Masao, to Koa Oil Co., Ltd. Process for preparation of high quality coke. 4,100,265, Cl. 423-449.000.
Yoshimura, Tooru; and Kuroda, Hiroshi, to Nissan Motor Company, Limited. Internal combustion engine equipped with catalytic converter. 4,099,377, Cl. 60-276.000.
Yoshinaka, Tadaaki, to Sony Corporation. Compensating time-based errors in a reproduced video signal. 4,100,567, Cl. 358-8.000.
Young, Gerald H. Oscillating engine. 4,099,448, Cl. 91-339.000.
Young, Lewis Brewster, to Mobil Oil Corporation. Selective production of para-substituted benzenes. 4,100,217, Cl. 260-671.00R.
Young, Roger W., to John Dusenbery Company, Inc. Cutting knife for winding machines. 4,099,435, Cl. 83-614.000.
Young, Ronald William: *See—*
Bloomer, Ivan; and Young, Ronald William, 4,100,066, Cl. 210-44.000.
Young, Wen. Flow control device for fluids flowing in a closed conduit. 4,099,700, Cl. 251-7.000.

Zaglio, Sergio, to Calzificio Golden Lady S.a.s. di Grassi Nerino & C. Device for the oriented collection of stockings, panty-hose and like articles. 4,099,789, Cl. 302-2.00R.

Zahid, Abduz, to Greer Hydraulics, Inc. Large port pressure accumulator. 4,099,545, Cl. 138-30.000.

Zahir, Abdul-Cader; and Renner, Alfred, to Ciba-Geigy Corporation. Process for the manufacture of crosslinked polymers which contain imide groups. 4,100,140, Cl. 526-90.000.

Zahn, Wolfgang: *See*—
Bickl, Horst; Findeis, Gunter; Treiber, Helmut; and Zahn, Wolfgang, 4,099,862, Cl. 355-35.000.

Zechnall, Martin: *See*—
Kiencke, Uwe; Flaig, Ulrich; Zechnall, Martin; and Honig, Gunter, 4,099,495, Cl. 123-32.0EB.

Zenith Radio Corporation: *See*—
Ditthardt, Alfred R., 4,100,576, Cl. 358-128.000.
Kaplan, Sam H., 4,100,452, Cl. 313-408.000.
Palac, Kazimir, 4,100,451, Cl. 313-404.000.

Zeren, Joseph D. Expanding arrowhead. 4,099,720, Cl. 273-106.50B.

Ziemann, Heinz: *See*—
Mazanek, Jan; Blahak, Johannes; Wagner, Kuno; and Ziemann, Heinz, 4,100,116, Cl. 521-167.000.

Zimmer, U.S.A. Inc.: *See*—
Cueman, Glenn F.; and Becker, Robert J., 4,099,524, Cl. 128-78.000.

Zimmerman, Dennis M.; and Marshall, Winston S., to Eli Lilly and Company. Novel cis N-cyclopropylmethyl decahydroisoquinoline. 4,100,166, Cl. 260-289.00D.

Zimmermann, Hans; Rudolph, Otfried; Peter, Gunter; and Weisbach, Gunter, to VEB Polygraph Leipzig Kombinat Fuer Polygraphische Maschinen und Ausruestungen. Support arrangement for guiding sheets through a printing machine. 4,099,463, Cl. 101-230.000.

Zollinger, J. Lamar: *See*—
Robins, Janis; and Zollinger, J. Lamar, 4,100,134, Cl. 528-10.000.

Zoric, Michael T.: *See*—
Mong, William K.; and Zoric, Michael T., 4,099,543, Cl. 137-625.220.

Zubkov, Vitaly Semenovich: *See*—
Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.

Zufich, Anthony C. Backpack and frame apparatus. 4,099,657, Cl. 224-25.00A.

Zvenyachkin, Viktor Matveevich: *See*—
Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; Zvenyachkin, Viktor Matveevich; Ivchenko, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; and Fedorov, Evgeny Petrovich, 4,099,572, Cl. 169-12.000.

Zweigart, Gerhard: *See*—
Kania, Siegmund; Zweigart, Gerhard; Luz, Karl; and Lutz, Edgar, 4,099,767, Cl. 296-137.00A.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF JULY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adams, David: *See—*
Kelly, Robert J.; Miller, Robert; and Adams, David, Re. 29,699, Cl. 428-414.000.

Baxter Travenol Laboratories, Inc.: *See—*
Fekete, Lajos F.; and Holst, Stephen L., Re. 29,698, Cl. 260-112.00B.

Berggren, Edith O., executrix: *See—*
Chin, Charles L. D.; Reilly, Joseph R.; Berggren, L. John, deceased; and Berggren, Edith O., executrix, Re. 29,696, Cl. 432-124.000.

Berggren, L. John, deceased: *See—*
Chin, Charles L. D.; Reilly, Joseph R.; Berggren, L. John, deceased; and Berggren, Edith O., executrix, Re. 29,696, Cl. 432-124.000.

Blake, Charles H., to Outboard Marine Corporation. Outboard motor with speed regulator for DC permanent magnet motor. Re. 29,695, Cl. 115-18.00E.

Chin, Charles L. D.; Reilly, Joseph R.; Berggren, L. John, deceased; and by Berggren, Edith O., executrix, to Monsanto Company. Apparatus improvements in temperature-conditioning parts. Re. 29,696, Cl. 432-124.000.

Dow Corning Corporation: *See—*
Mink, Alan E., Re. 29,697, Cl. 260-37.0SB.

Fekete, Lajos F.; and Holst, Stephen L., to Baxter Travenol Laboratories, Inc. Stabilization of AHF using heparin. Re. 29,698, Cl. 260-112.00B.

Foll, Gerhard; and Lahm, Heinrich, to Index-Werke KG Hahn & Tessky. Tool support for use in machine tools particularly in turning machines. Re. 29,694, Cl. 29-36.000.

Holst, Stephen L.: *See—*
Fekete, Lajos F.; and Holst, Stephen L., Re. 29,698, Cl. 260-112.00B.

Index-Werke KG Hahn & Tessky: *See—*
Foll, Gerhard; and Lahm, Heinrich, Re. 29,694, Cl. 29-36.000.

Kelly, Robert J.; Miller, Robert; and Adams, David, to Uniroyal, Inc. Adhesion of polyester to rubber using an adhesive containing added metal compounds. Re. 29,699, Cl. 428-414.000.

Lahm, Heinrich: *See—*
Foll, Gerhard; and Lahm, Heinrich, Re. 29,694, Cl. 29-36.000.

Little, Arthur J.; and Mayer, William R., to Stewart-Warner Corporation. Timed buzzer. Re. 29,701, Cl. 340-403.000.

Mayer, William R.: *See—*
Little, Arthur J.; and Mayer, William R., Re. 29,701, Cl. 340-403.000.

Miller, Robert: *See—*
Kelly, Robert J.; Miller, Robert; and Adams, David, Re. 29,699, Cl. 428-414.000.

Mink, Alan E., to Dow Corning Corporation. Low temperature solventless silicone resins. Re. 29,697, Cl. 260-37.0SB.

Monsanto Company: *See—*
Chin, Charles L. D.; Reilly, Joseph R.; Berggren, L. John, deceased; and Berggren, Edith O., executrix, Re. 29,696, Cl. 432-124.000.

Outboard Marine Corporation: *See—*
Blake, Charles H., Re. 29,695, Cl. 115-18.00E.

Reilly, Joseph R.: *See—*
Chin, Charles L. D.; Reilly, Joseph R.; Berggren, L. John, deceased; and Berggren, Edith O., executrix, Re. 29,696, Cl. 432-124.000.

Stewart-Warner Corporation: *See—*
Little, Arthur J.; and Mayer, William R., Re. 29,701, Cl. 340-403.000.

Uniroyal, Inc.: *See—*
Kelly, Robert J.; Miller, Robert; and Adams, David, Re. 29,699, Cl. 428-414.000.

U.S. Philips Corporation: *See—*
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4,099,321
4,099,322
629 4,099,323
739 4,099,324
741 4,099,325

CLASS 30

135 4,099,326
161 4,099,327
172 4,099,328

CLASS 32

2 4,099,329

CLASS 33

18 R 4,099,330
88 4,099,331
126.7 R 4,099,332
203.12 4,099,333
346 4,099,334

CLASS 34

9 4,099,335
12 4,099,336
26 4,099,337
35 4,099,338

CLASS 35

18 A 4,099,339
19 R 4,099,340

CLASS 36

7.3 4,099,341
44 4,099,342

CLASS 43

42.19 4,099,343

CLASS 44

1 F 4,099,929
56 4,099,930
80 4,099,931

CLASS 47

26 4,099,344
56 4,099,345

CLASS 48

197 R 4,099,932
202 4,099,933

CLASS 49

82 4,099,346
399 4,099,347

CLASS 51

92 R 4,099,348
101 R 4,099,349
295 4,099,934
309 R 4,099,935
338 4,099,350

CLASS 52

2 4,099,351
80 4,099,352
139 4,099,353
146 4,099,354
404 4,099,355
520 4,099,356
533 4,099,357
588 4,099,358
630 4,099,359
745 4,099,360

CLASS 53

42 4,099,361
123 4,099,362
124 D 4,099,363

CLASS 55

75 4,099,936
212 4,099,937
230 4,099,938
246 4,099,939
269 4,099,941
300 4,099,940
396 4,099,942
487 4,099,943
501 4,099,944

CLASS 56

1 4,099,364
13.5 4,099,365
13.6 4,099,366
208 4,099,368
314 4,099,369
336 4,099,367

CLASS 57

144 4,099,370

CLASS 58

22.7 4,099,371
85.5 4,099,372

CLASS 60

39.12 4,099,374
39.5 4,099,375
39.67 4,099,373
253 4,099,376
276 4,099,377
413 4,099,378
427 4,099,379
588 4,099,380
641 4,099,381
648 4,099,382
4,099,383
657 4,099,384
678 4,099,385

CLASS 61

45 R 4,099,386
63 4,099,387
85 4,099,388

CLASS 62

30 4,099,945
73 4,099,946
532 4,099,947

CLASS 65

1 4,099,948
17 4,099,949
99 A 4,099,950
135 4,099,951
182 R 4,099,952
335 4,099,953

CLASS 66

9 R 4,099,389
50 R 4,099,390
121 4,099,391
140 R 4,099,392

CLASS 68

22 R 4,099,393

CLASS 70

233 4,099,394
360 4,099,395
363 4,099,396
371 4,099,397
406 4,099,398

CLASS 71

87 4,099,954
98 4,099,955
120 4,099,956
122 4,099,957

CLASS 72

38 4,099,399
122 4,099,400
147 4,099,401
234 4,099,402
288 4,099,403

CLASS 73

45.2 4,099,404
46 4,099,405
73 4,099,406
88.5 R 4,099,407
95 4,099,408
133 R 4,099,409
141 R 4,099,411
151.5 4,099,410
209 4,099,412
359 R 4,099,413
373 4,099,414
497 4,099,415
602 4,099,416
606 4,099,417
622 4,099,418
626 4,099,419
629 4,099,420

CLASS 74

10.33 4,099,421
231 C 4,099,422
243 R 4,099,423
251 R 4,099,424
501 P 4,099,425
730 4,099,426
804 4,099,427

CLASS 75

0.5 BA 4,099,958
10 R 4,099,959
11 4,099,960
20 F 4,099,961
26 4,099,962
35 4,099,963
52 4,099,964
68 R 4,099,965
125 4,099,966
128 A 4,099,967

CLASS 81

9.51 4,099,428
57.17 4,099,429
58.1 4,099,430

CLASS 82

9 4,099,431
14 A 4,099,432

CLASS 83

155 4,099,433
157 4,099,434
614 4,099,435
617 4,099,436

CLASS 84

1.01 4,099,437
1.25 4,099,438
1.26 4,099,439
258 4,099,440
327 4,099,441
382 4,099,442
457 4,099,443

CLASS 85

8.8 4,099,444

CLASS 89

7 4,099,445

CLASS 90

13.1 4,099,446

CLASS 91

218 4,099,447
339 4,099,448
358 A 4,099,449
403 4,099,450

CLASS 92

241 4,099,451

CLASS 96

1 SD 4,099,968
1.5 N 4,099,970
1.5 R 4,099,969
27 H 4,099,971
29 D 4,099,972
115 R 4,099,973

CLASS 98

58 4,099,452

CLASS 99

306 4,099,453
358 4,099,454
450.1 4,099,455
638 4,099,456

CLASS 100

42 4,099,457
116 4,099,458

CLASS 101

35 4,099,459
44 4,099,460
119 4,099,461
153 4,099,462
230 4,099,463

CLASS 102

24 HC 4,099,464
204 4,099,465
215 4,099,466
217 4,099,467

CLASS 105

310 4,099,468

CLASS 106

1.23 4,099,974
15 FP 4,099,975
15 R 4,099,976
39.7 4,100,001
53 4,099,977
4,099,978
58 4,099,979
288 Q 4,099,980
308 Q 4,099,981

CLASS 108

1 4,099,469
26 4,099,470
114 4,099,472

CLASS 110

182.5 4,099,471
219 4,099,473

CLASS 112

258 4,099,474

CLASS 113

116 QA 4,099,475

CLASS 114

144 R 4,099,476
281 4,099,477

CLASS 115

18 E Re.29,695
4,099,478
41 R 4,099,479

CLASS 116

135 4,099,480

CLASS 118

8 4,099,481
9 4,099,482
49.1 4,099,483
117 4,099,484
301 4,099,485
635 4,099,486
651 4,099,487

CLASS 122

156 4,099,488

CLASS 123

3 4,099,489
32 EA 4,099,493
32 EB 4,099,495
32 EE 4,099,491
32 JV 4,099,494
32 ST 4,099,492
41.31 4,099,496
117 A 4,099,497
117 R 4,099,498
122 AB 4,099,500
4,099,503
4,099,504
122 AC 4,099,502
122 E 4,099,499
4,099,501
139 AW 4,099,505
140 J 4,099,506
148 AC 4,099,509
148 D 4,099,510
148 DC 4,099,508
148 E 4,099,507
210 4,099,490

CLASS 126

190 4,099,511
246 4,099,512
270 4,099,513
4,099,514
271 4,099,515
4,099,516
4,099,517

CLASS 127

61 4,099,982
63 4,099,983

CLASS 128

2 B 4,099,518
2 F 4,099,520
2.1 R 4,099,519
66 4,099,522
75 4,099,523
78 4,099,524
87 R 4,099,525
020 4,099,521
146.6 4,099,526
214 C 4,099,527
214.4 4,099,528
305 4,099,529
419 PT 4,099,530

CLASS 131

17 R 4,099,531

CLASS 133

5 A 4,099,532

CLASS 134

2 4,099,984
4 4,099,985

CLASS 135

3 E 4,099,533
4 A 4,099,534
66 4,099,535

CLASS 136

89 TF 4,099,986

CLASS 137

2 4,099,536
13 4,099,537
73 4,099,538
84 4,099,539
493.8 4,099,540
596.13 4,099,541
615 4,099,542
625.22 4,099,543
856 4,099,544

CLASS 138

30 4,099,545

CLASS 139

27 4,099,546

CLASS 141

5 4,099,547
27 4,099,548
32 4,099,549
51 4,099,550
388 4,099,551

CLASS 144

134 D 4,099,552

CLASS 148

1.5 4,099,987
3 4,099,988
6.27 4,099,989
6.35 4,099,990
11.5 C 4,099,991
11.5 N 4,099,992
14 4,099,993
35 4,099,994
101 4,099,995
131 4,099,996
187 4,099,997
4,099,998
4,099,999

CLASS 149

4 4,100,000

CLASS 156

48 4,100,002
54 4,100,003
60 4,100,004
73.1 4,100,005
78 4,100,006
86 4,100,007
180 4,100,008
184 4,100,009
242 4,100,010
272 4,100,011
351 4,100,012

441 4,100,013
647 4,100,014
665 4,100,015

CLASS 162

16 4,100,016
111 4,100,017
203 4,100,018

CLASS 165

22 4,099,553
32 4,099,554
55 4,099,555
96 4,099,556
104 S 4,099,557
4,099,558
170 4,099,559

CLASS 166

0.5 4,099,560
55.1 4,099,561
84 4,099,562
191 4,099,563
241 4,099,564
252 4,099,565
260 4,099,566
261 4,099,567
269 4,099,568
273 4,099,569
303 4,099,570
315 4,099,571

CLASS 169

12 4,099,572
37 4,099,573
47 4,099,574

CLASS 172

59 4,099,575
555 4,099,576
781 4,099,577
802 4,099,578

CLASS 173

4 4,099,579
118 4,099,580
133 4,099,581

CLASS 174

15 R 4,100,366
28 4,100,367
138 D 4,100,368

CLASS 175

5 4,099,582
7 4,099,583
14 4,099,584
320 4,099,585

CLASS 176

50 4,100,019
68 4,100,020
87 4,100,021

CLASS 177

159 4,099,586
210 EM 4,099,587

CLASS 178

67 4,100,369

CLASS 179

1 C 4,100,373
1 E 4,100,371
1 G 4,100,372
1 SB 4,100,370
1.5 S 4,100,374
2 A 4,100,375
15 AS 4,100,377
15 BP 4,100,376
84 VF 4,100,378
147 R 4,100,379
175.1 A 4,100,380

CLASS 180

14 B 4,099,594
44 F 4,099,588
65 A 4,099,589
69 C 4,099,590
98 4,099,591
108 4,099,592
114 4,099,593

CLASS 182

48 4,099,595
4,099,596

CLASS 184

27 B 4,099,597
106 4,099,598

CLASS 187

52 R 4,099,599

CLASS 188

73.4 4,099,600
163 4,099,601
300 4,099,602

CLASS 192

3.31 4,099,603
98 4,099,605
111 A 4,099,604

CLASS 195

1.8 4,100,022
27 4,100,023
29 4,100,024
31 F 4,100,025
51 G 4,100,026
4,100,027
66 R 4,100,028
68 4,100,029
103.5 R 4,100,030

CLASS 198

341 4,099,607
347 4,099,608
395 4,099,609
729 4,099,610

CLASS 200

38 A 4,100,381
61.46 4,100,382
157 4,100,383
160 4,100,384
268 4,100,385

CLASS 201

6 4,100,031
27 4,100,032
4,100,033
39 4,100,034

CLASS 202

227 4,100,035

CLASS 204

14 R 4,100,036
15 4,100,037
38 B 4,100,038
43 N 4,100,039
55 R 4,100,040
58 4,100,041
105 R 4,100,042
108 4,100,043
146 4,100,044
159.16 4,100,045
159.23 4,100,046
4,100,047
195 P 4,100,048
242 4,100,049
252 4,100,050
266 4,100,051
268 4,100,052
279 4,100,053
297 W 4,100,054
298 4,100,055
300 R 4,100,068

CLASS 206

45.14 4,099,611
45.19 4,099,612
45.34 4,099,613
299 4,099,614
329 4,099,615
427 4,099,616
443 4,099,617
454 4,099,618
524.1 4,099,619

CLASS 208

57 4,100,056
206 4,100,057
264 4,100,058

CLASS 209

3 4,100,059
74 R 4,099,620
80.5 4,100,060
98 4,099,621
114 4,099,622
139 A 4,100,061

CLASS 210

14 4,100,062
17 4,100,063
23 H 4,100,064
38 B 4,100,065
44 4,100,066
58 4,100,067
109 4,100,069
136 4,100,070
197 4,100,071
242 S 4,100,072
532 S 4,100,073

CLASS 211

41 4,099,623
42 4,099,624
49 R 4,099,625
60 R 4,099,626
163 4,099,627

CLASS 212

65 4,099,628

CLASS 214

1 HH 4,099,629
2.5 4,099,630
10 4,099,631
17 DA 4,099,632
4,099,633
86 R 4,099,634
152 4,099,635
4,099,636
306 4,099,637

CLASS 215

12 R 4,099,638
209 4,099,639

CLASS 219

10.55 M 4,100,386
10.57 4,100,387
69 M 4,100,388
74 4,100,389
4,100,390
81 4,100,391
121 EM 4,100,392
121 LM 4,100,393
296 4,100,394
356 4,100,395
384 4,100,396
512 4,100,397
541 4,100,398

CLASS 220

6 4,099,640
90.4 4,099,642
222 4,099,643
225 4,099,644
304 4,099,645
324 4,099,646
334 4,099,647
340 4,099,648
403 4,099,665
439 4,099,649
444 4,099,641

CLASS 221

266 4,099,650

CLASS 222

94 4,099,651
135 4,099,652
146 HE 4,099,653
184 4,099,654
211 4,099,655

CLASS 224

5 W 4,099,656
25 A 4,099,657
42.1 F 4,099,658

CLASS 227

130 4,099,659

CLASS 228

13 4,099,660
107 4,099,661
151 4,099,662
159 4,099,663

CLASS 229

5.7 4,099,664
62 4,099,666

CLASS 233

24 4,099,667

CLASS 235

92 CC 4,100,399
92 FL 4,100,400
92 T 4,100,401
145 R 4,100,402
304 4,099,668
312 4,100,403

CLASS 239

11 4,099,669
205 4,099,670
265.29 4,099,671
317 4,099,672
415 4,099,673
431 4,099,674
498 4,099,675
687 4,099,676

CLASS 241

186 A 4,099,677
243 4,099,678

CLASS 242

18 A 4,099,680
18 PW 4,099,679
55.2 4,099,681
56 R 4,099,682
107 4,099,683
4,099,684
107.4 B 4,099,685
198 4,099,686

CLASS 244

7 R 4,099,687
103 R 4,099,688
136 4,099,689
153 R 4,099,690
207 4,099,691

CLASS 246

34 CT 4,099,692

CLASS 248

210 4,099,693
339 4,099,694
351 4,099,695
358 R 4,099,696
385 4,099,697
493 4,099,698

CLASS 250

199 4,100,404
202 4,100,405
213 VT 4,100,406
214 P 4,100,407
230 4,100,408
305 4,100,409
311 4,100,410
324 4,100,411
343 4,100,412
366 4,100,413
391 4,100,414
455 4,100,415
461 B 4,100,416
505 4,100,417
510 4,100,418
514 4,100,419
533 4,100,421
551 4,100,422
4,100,423
559 4,100,424
561 4,100,420
4,100,425

CLASS 251

1 B 4,099,699
7 4,099,700
30 4,099,701
95 4,099,702
122 4,099,703
134 4,099,704
171 4,099,705
367 4,099,706

CLASS 252

8.1 4,100,074
4,100,075
4,100,076
4,100,077
8.55 C 4,100,079
8.9 4,100,078
18 4,100,080
25 4,100,081
33.4 4,100,082
34 4,100,083
39 4,100,084
42.7 4,100,085
50 4,100,086
62.1 P 4,100,087
62.52 4,100,088
63 4,100,089
63.7 4,100,090
70 4,100,091
4,100,092
89 R 4,100,093
4,100,094
99 4,100,095
145 4,100,096
4,100,097
188 4,100,098
189 4,100,099
4,100,100
301.4 H 4,100,101
305 4,100,102
316 4,100,103
428 4,100,104
429 R 4,100,105
437 4,100,106
443 4,100,107
455 Z 4,100,108
465 4,100,109
522 4,100,110

CLASS 254

35 4,099,707

CLASS 260

8 4,100,117
18 PT 4,100,118
22 CB 4,100,119
4,100,120
23 EP 4,100,121
28.5 B 4,100,122
4,100,123
29.2 M 4,100,124
29.6 AQ 4,100,126
29.6 NR 4,100,127
29.6 TA 4,100,125
33.6 UA 4,100,128
37 PC 4,100,130
37 SB Re.29,697
4,100,129
42.21 4,100,131
42.46 4,100,132
45.9 L 4,100,133
112 B Re.29,698
112 G 4,100,151
112 R 4,100,149
4,100,150
112.5 S 4,100,153
112.5 TR 4,100,152
123.7 4,100,154
124 R 4,100,155
174 4,100,156
4,100,157
185 4,100,112
279 QA 4,100,162
283 SA 4,100,163
287 B 4,100,164
288 CF 4,100,165
289 D 4,100,166
296 R 4,100,167
299 4,100,168
306.8 R 4,100,169
326.33 4,100,171
327 H 4,100,172
333 4,100,173
340.9 R 4,100,174
345.5 4,100,175
345.7 P 4,100,176
345.8 P 4,100,177
4,100,178
346.75 4,100,179
347.8 4,100,180
416 4,100,181
429.9 4,100,182
438.1 4,100,183
464 4,100,184
465 F 4,100,185
465.8 D 4,100,186
502.5 4,100,187
535 P 4,100,188
541 4,100,189
543 H 4,100,190
557 R 4,100,191
558 R 4,100,192
563 P 4,100,193
576 4,100,194
4,100,195
585 D 4,100,196
586 P 4,100,197
586 R 4,100,198
606.5 B 4,100,199
609 R 4,100,200
615 A 4,100,201
652 R 4,100,210
656 R 4,100,211
660 4,100,212
666 P 4,100,213
666 PY 4,100,216
668 A 4,100,214
671 M 4,100,215
671 R 4,100,217
673 4,100,218
682 4,100,219
683.15 R 4,100,220
835 4,100,221
837 PV 4,100,222
857 L 4,100,223
860 4,100,144
862 4,100,224
878 R 4,100,225
879 4,100,226
880 R 4,100,227
4,100,228
887 4,100,229
972 4,100,230
978 4,100,231

CLASS 261

36 A 4,100,232
121 B 4,100,234
142 4,100,235

CLASS 264

8 4,100,236
40.6 4,100,237
49 4,100,238
102 4,100,239
108 4,100,240
113 4,100,241
115 4,100,242
171 4,100,243
211 4,100,244
4,100,245
230 4,100,246
271 4,100,247
273 4,100,248
313 4,100,249

CLASS 266

44 4,099,709
281 4,099,708

CLASS 270

68 A 4,099,710

CLASS 271

64 4,099,711
184 4,099,712

CLASS 272

93 4,099,713

CLASS 273

1 F 4,099,714
63 E 4,099,715
73 C 4,099,718
73 E 4,099,716
4,099,717
101.2 4,099,719
106.5 B 4,099,720
139 4,099,721
143 R 4,099,722
241 4,099,723

CLASS 274

47 4,099,724

CLASS 277

1 4,099,725
4,099,726
3 4,099,727
96 4,099,728
96.1 4,099,729
139 4,099,730
164 4,099,731

CLASS 279

2 A 4,099,732

CLASS 280

6.1 4,099,733
11.2 4,099,734
79.3 4,099,735
154.5 R 4,099,736
261 4,099,737
289 D 4,099,738
504 4,099,739
678 4,099,740
712 4,099,741
714 4,099,742
753 4,099,743

CLASS 285

7 4,099,744
24 4,099,745
119 4,099,746
174 4,099,747
256 4,099,748
398 4,099,749

CLASS 289

1.5 4,099,750

CLASS 292

139 4,099,751
144 4,099,752
177 4,099,753
206 4,099,754
251.5 4,099,755
336.3 4,099,756
4,099,757
341.18 4,099,758

CLASS 293

71 P 4,099,759
73 4,099,760

CLASS 294

86 R 4,099,761
88 4,099,762

CLASS 296

24 R 4,099,764
28 C 4,099,763
93 4,099,765
137 A 4,099,767
137 B 4,099,766

CLASS 297

63 4,099,768
204 4,099,769
216 4,099,770
217 4,099,771
220 4,099,772
270 4,099,773
298 4,099,774
303 4,099,775
329 4,099,776
375 4,099,777
386 4,099,778
408 4,099,779
411 4,099,780

CLASS 299

1 4,099,781
4,099,782
2 4,099,783
10 4,099,784
11 4,099,785
43 4,099,786
4,099,787

CLASS 301

105 R 4,099,788

CLASS 302

2 R 4,099,789

CLASS 303

7 4,099,790
24 F 4,099,791
113 4,099,792
116 4,099,793

CLASS 305

13 4,099,794
18 4,099,795
46 4,099,796
54 4,099,797

CLASS 307

41 4,100,426
87 4,100,427
97 4,100,428
205 4,100,429
4,100,430
213 4,100,431
229 4,100,432
4,100,433
252 L 4,100,434
262 4,100,435
296 R 4,100,436
297 4,100,437
304 4,100,438

CLASS 308

3.5 4,099,798
5 R 4,099,799
6 R 4,099,800
9 4,099,801
4,099,802
215 4,099,803
237 R 4,099,804
240 4,099,805

CLASS 310

57 4,100,439
89 4,100,440
103 4,100,441
164 4,100,443
184 4,100,444
317 4,100,442

CLASS 312

117 4,099,806
138 R 4,099,808
140.2 4,099,809
183 4,099,810
211 4,099,811
214 4,099,812
243 4,099,813
317 R 4,099,814
330 R 4,099,815

CLASS 313

101 4,100,445
161 4,100,446
217 4,100,447
318 4,100,448
337 4,100,449
360 4,100,450
404 4,100,451
408 4,100,452
417 4,100,453
495 4,100,454
496 4,100,455
497 4,100,456

CLASS 315

5.51 4,100,457
39.55 4,100,458
127 4,099,807
136 4,100,459
162 4,100,460
169 TV 4,100,461
179 4,100,462
205 4,100,463
297 4,100,476
397 4,100,464

CLASS 318

41 4,100,465
102 4,100,466
220 R 4,100,467
221 C 4,100,468
227 4,100,469
466 4,100,470
685 4,100,471
4,100,472
696 4,100,473

CLASS 320

17 4,100,474
35 4,100,475

CLASS 323

19 4,100,477
4,100,478
4,100,479
51 4,100,480

CLASS 324

4 4,100,481
6 4,100,482
4,100,483
32 4,100,484
62 4,100,486
96 4,100,487
127 4,100,488
158 F 4,100,489
182 4,100,490
204 4,100,491
208 4,100,485
254 4,100,492

CLASS 325

38 B 4,100,493
4,100,494
323 4,100,495
369 4,100,496
470 4,100,497

CLASS 328

14 4,100,498

CLASS 329

50 4,100,499
103 4,100,500

CLASS 330

257 Re.29,700
263 4,100,501
264 4,100,502

CLASS 331

1 A 4,100,503
39 4,100,504
71 4,100,505
94.5 G 4,100,507
94.5 H 4,100,508
94.5 L 4,100,509
107 A 4,100,511
107 R 4,100,510
158 4,100,512

CLASS 333

6 4,100,516
31 A 4,100,514
70 T 4,100,513
71 4,100,506
80 R 4,100,515

CLASS 335

37 4,099,865
132 4,100,517
212 4,100,518
262 4,100,519

CLASS 336

30 4,100,520
100 4,100,521

CLASS 337

68 4,100,522
163 4,100,523

CLASS 338

2 4,100,524
195 4,100,525
279 4,100,526

CLASS 339

17 CF 4,099,816
22 B 4,099,817
45 R 4,099,818
75 M 4,099,819
88 R 4,099,820
91 R 4,099,821
98 4,099,822
113 B 4,099,823
157 C 4,099,824
177 E 4,099,825
198 R 4,099,826
228 4,099,827
258 F 4,099,828

CLASS 340

10 4,100,527
18 LD 4,100,528
32 4,100,529
53 4,100,530
146.1 E 4,100,531
146.3 MA 4,100,532
147 R 4,100,533
149 A 4,100,534
166 R 4,100,535
207 R 4,100,536
324 M 4,100,540
347 DD 4,100,541
403 Re.29,701
518 4,100,542
521 4,100,543
546 4,100,539
617 4,100,538
626 4,100,537

CLASS 343

6.5 R 4,100,544
7 ED 4,100,545
708 4,100,546
721 4,100,547
837 4,100,548

CLASS 346

140 A 4,100,549
140 R 4,100,550
162 4,100,551
4,100,552

CLASS 350

6.1 4,099,829
6.8 4,099,830
9 4,099,831
96.14 4,099,836
96.21 4,099,832
96.25 4,099,833
96.29 4,099,837
96.30 4,099,835
96.34 4,099,834
105 4,099,838
166 4,099,840
173 4,099,841
175 E 4,099,842
176 4,099,843
184 4,099,844
4,099,845
186 4,099,846
187 4,099,847
189 4,099,848
214 4,099,849
215 4,099,850
246 4,099,851
247 4,099,852
310 4,099,853
312 4,099,854
333 4,099,855
350 4,099,856
351 4,099,857
357 4,099,839

CLASS 351

62 4,099,858
160 4,099,859

CLASS 354

64 4,100,553
145 4,100,554
166 4,100,555
4,100,556
225 4,100,557
271 4,100,558
277 4,100,559
307 4,100,560

CLASS 355

3 SC 4,099,863
14 4,099,860
15 4,099,861
35 4,099,862
37 4,099,864
58 4,099,866
73 4,099,867
106 4,099,868
108 4,099,869

CLASS 356

28 4,099,870
73 4,099,871
85 4,099,872
86 4,099,873
102 4,099,874
103 4,099,875
106 LR 4,099,876
124 4,099,877
128 4,099,878
141 4,099,879
164 4,099,880
171 4,099,881
181 4,099,882
187 4,099,883
200 4,099,884
223 4,099,885
244 4,099,886

CLASS 357

13 4,100,561
19 4,100,562
27 4,100,563
46 4,100,564
51 4,100,565
70 4,100,566

CLASS 358

8 4,100,567
21 4,100,568
22 4,100,569
44 4,100,570
87 4,100,571
93 4,100,572
113 4,100,573
4,100,574
120 4,100,575
128 4,100,576
4,100,577
191 4,100,578
230 4,100,579
260 4,100,580

CLASS 360

12 4,100,581
80 4,100,582
113 4,100,583
125 4,100,584
130 4,100,585

CLASS 361

58 4,100,586
82 4,100,587
127 4,100,588
399 4,100,589

CLASS 362

16 4,100,590
190 4,100,591
191 4,100,592
267 4,100,593
308 4,100,594

CLASS 363

133 4,100,595
148 4,100,596

CLASS 364

200 4,100,601
474 4,100,597
476 4,100,598
565 4,100,599
710 4,100,600
715 4,100,602
771 4,100,603
827 4,100,604
900 4,100,605
4,100,606
4,100,607

CLASS 365

2 4,100,608
87 4,100,609

CLASS 366

102 4,100,610
139 4,100,611
143 4,100,612
4,100,613
154 4,100,614
169 4,100,615
188 4,100,617
213 4,100,616
297 4,100,618

CLASS 400

4 4,099,606

CLASS 403

4,099,887
172 4,099,888

CLASS 408

239 R 4,099,889

CLASS 415

170 A 4,099,890
207 4,099,891

CLASS 416

134 A 4,099,892

CLASS 417

300 4,099,893
499 4,099,894
4,099,895

CLASS 418

184 4,099,896

CLASS 423

34 4,100,250
63 4,100,251
68 4,100,252
87 4,100,253
163 4,100,254
210 4,100,255
220 4,100,256
226 4,100,257
242 4,100,258
4,100,259
4,100,260
309 4,100,261
329 4,100,262
345 4,100,233
383 4,100,263
430 4,100,264
449 4,100,265
574 R 4,100,266

CLASS 424

1 4,100,267
12 4,100,268
49 4,100,269
54 4,100,270
78 4,100,271
92 4,100,272
117 4,100,273
177 4,100,274
211 4,100,275
238 4,100,276
244 4,100,277
4,100,278
246 4,100,280
4,100,281
4,100,282
248.5 4,100,283
250 4,100,284
4,100,285
251 4,100,286
4,100,287
260 4,100,288
266 4,100,289
4,100,290
267 4,100,291
273 R 4,100,292
274 4,100,160
4,100,161
4,100,293
275 4,100,294
278 4,100,295
4,100,296
304 4,100,297
4,100,298
325 4,100,170
330 4,100,299
343 4,100,300

CLASS 425

4 C 4,099,897
192 S 4,099,898
222 4,099,899
313 4,099,900
388 4,099,901
4,099,902
4,099,903
533 4,100,307
563 4,099,904
589 4,099,905

CLASS 426

3 4,100,301
90 4,100,302
106 4,100,303
281 4,100,304
385 4,100,305
386 4,100,306
554 4,100,308

CLASS 427

2 4,100,309
8 4,100,310
44 4,100,311
96 4,100,312
130 4,100,326
162 4,100,313
228 4,100,314
379 4,100,315

CLASS 428

10 4,100,316
137 4,100,317
159 4,100,318
171 4,100,319
188 4,100,320
207 4,100,321
257 4,100,322
280 4,100,323
288 4,100,324
334 4,100,325
339 4,100,327
407 4,100,328
413 4,100,329
414 Re.29,699
429 4,100,330

CLASS 429

13 4,100,331
27 4,100,332
156 4,100,333

CLASS 431

66 4,099,906
254 4,099,907
284 4,099,908

CLASS 432

124 Re.29,696

CLASS 521

38 4,100,113
83 4,100,115
167 4,100,116
175 4,100,114

CLASS 526

1 4,100,334
10 4,100,335
21 4,100,137
67 4,100,336
68 4,100,142
90 4,100,140
130 4,100,337
142 4,100,338
193 4,100,339
245 4,100,340
262 4,100,138
301 4,100,141
4,100,143

CLASS 528

10 4,100,134
11 4,100,135
4,100,136
116 4,100,111
196 4,100,139
312 4,100,145
313 4,100,146
362 4,100,147
374 4,100,148

CLASS 536

56 4,100,341
103 4,100,342

CLASS 542

426 4,100,343

CLASS 544

21 4,100,344
4,100,345
27 4,100,346
49 4,100,347
225 4,100,158
277 4,100,159

CLASS 548

310 4,100,348
337 4,100,349

CLASS 560

20 4,100,350
24 4,100,351
53 4,100,352
55 4,100,353
89 4,100,354
121 4,100,355
4,100,356
4,100,357
180 4,100,358
232 4,100,359
4,100,360
244 4,100,361
246 4,100,362
255 4,100,363

CLASS 568

730 4,100,202
4,100,203
4,100,204
4,100,205
4,100,206
804 4,100,207
902 4,100,208
918 D 4,100,209

CLASSIFICATION OF DESIGNS

D2—	27	248,426		109	248,442		60	248,455		11	248,469	D19—	91	248,483	D29—	8	248,497
	270	248,427		137	248,439		71	248,456			248,470			248,484	D34—	15 PP	248,498
	309	248,428		208	248,443		81	248,457		34	248,471	D23—	4	248,485	D48—	2	248,499
		248,429	D8—	302	248,444	D11—	88	248,458		70	248,472		90.1	248,486			248,500
D6—	36	248,430		310	248,445		96	248,459		71	248,473			248,487		20 F	248,501
	63	248,431		323	248,446	D12—	55	248,460	D15—	29	248,474	D24—	1.1	248,488		23 R	248,502
	72	248,432		354	248,447		85	248,461		30	248,475		3	248,489			248,503
	125	248,433	D9—	10	248,448		192	248,462		63	248,476		17	248,490		24 R	248,504
		248,434		111	248,449		194	248,463		66	248,477		25	248,491		36	248,505
	159	248,435		128	248,450	D13—	17	248,464		71	248,478		33	248,492	D52—	2 B	248,506
	167	248,436		184	248,451		24	248,465		135	248,479		36	248,493	D87—	1 R	248,507
	168	248,437		190	248,452		32	248,466			248,480		54	248,494			248,508
	241	248,438		254	248,453	D14—	6	248,467			248,481			248,495		5 F	248,509
D7—	61	248,440	D10—	50	248,454			248,468	D16—	32	248,482	D25—	5	248,496	D88—	5	248,510
	75	248,441															

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P.—	9	4,277		4,278		68	4,279		88	4,276	

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PATENTS

1 :	4,099,635		4,099,989		4,099,723		4,099,291		4,099,335		4,100,451
	4,099,708		4,099,999		4,100,431		4,099,332		4,099,354		4,100,452
	4,100,068		4,100,055		4,100,497		4,099,382		4,099,368		4,100,505
	4,100,551		4,100,080		4,100,596		4,099,383		4,099,378		4,100,515
2 :	4,099,501		4,100,081	06 :	4,099,272		4,100,284		4,099,397		4,100,535
4 :	4,100,003		4,100,107		4,099,277	10 :	4,100,056		4,099,403		4,100,538
	4,100,237		4,100,138		4,099,282		4,100,202		4,099,412		4,100,576
	4,100,433		4,100,146		4,099,290		4,100,203		4,099,443		4,100,578
	4,100,563		4,100,174		4,099,415		4,100,204		4,099,460		4,100,587
5 :	4,099,681		4,100,331		4,099,429		4,100,205		4,099,462	18 :	4,099,372
6 :	Re.29,698		4,100,333		4,099,440		4,100,206		4,099,472		4,099,424
	4,099,317		4,100,393		4,099,533		4,100,323		4,099,473		4,099,468
	4,099,359		4,100,398		4,099,535		4,100,360		4,099,482		4,099,524
	4,099,405		4,100,401		4,099,584	11 :	4,099,527		4,099,494		4,099,724
	4,099,441		4,100,430		4,099,602	12 :	4,099,313		4,099,515		4,099,768
	4,099,465		4,100,437		4,099,626		4,099,344		4,099,529		4,099,893
	4,099,466		4,100,441		4,099,644		4,099,373		4,099,551		4,099,927
	4,099,480		4,100,477		4,099,648		4,099,423		4,099,556		4,099,991
	4,099,512		4,100,478		4,099,712		4,099,448		4,099,559		4,099,996
	4,099,520		4,100,498		4,099,715		4,099,477		4,099,576		4,100,065
	4,099,542		4,100,516		4,099,728		4,099,521		4,099,577		4,100,117
	4,099,545		4,100,524		4,099,751		4,099,522		4,099,588		4,100,166
	4,099,547		4,100,541		4,099,807		4,099,606		4,099,616		4,100,280
	4,099,548		4,100,568		4,099,854		4,099,773		4,099,664		4,100,518
	4,099,560		4,100,569		4,099,878		4,099,829		4,099,674	19 :	4,099,328
	4,099,563		4,100,584		4,099,940		4,100,181		4,099,682		4,099,366
	4,099,564		4,100,586		4,099,971		4,100,318		4,099,743		4,099,553
	4,099,580		4,100,601		4,100,089		4,100,373		4,099,754		4,099,629
	4,099,593		4,100,607		4,100,108		4,100,419		4,099,763		4,100,272
	4,099,620	8 :	4,099,698		4,100,112		4,100,487		4,099,795		4,100,614
	4,099,634		4,099,720		4,100,145		4,100,504		4,099,796	20 :	4,099,455
	4,099,643		4,099,747		4,100,242		4,100,539		4,099,811		4,099,538
	4,099,651		4,099,769		4,100,271		4,100,571		4,099,817		4,099,812
	4,099,657		4,099,866		4,100,322		4,100,589		4,099,819	21 :	4,099,279
	4,099,660		4,099,949		4,100,375	13 :	4,099,288		4,099,869		4,099,585
	4,099,669		4,100,043		4,100,403		4,099,393		4,099,916		4,099,705
	4,099,686		4,100,044		4,100,460		4,099,399		4,099,964		4,099,707
	4,099,694		4,100,147		4,100,480		4,099,470		4,100,057		4,099,775
	4,099,700		4,100,532		4,100,503		4,099,625		4,100,058		4,099,776
	4,099,719	9 :	4,099,624		4,100,513		4,099,714		4,100,070		4,099,853
	4,099,734		4,099,872		4,100,536		4,099,822		4,100,096		4,099,938
	4,099,741		4,100,020		4,100,537		4,100,098		4,100,119		4,100,092
	4,099,750		4,100,132		4,100,544		4,100,260		4,100,167		4,100,592
	4,099,752		4,100,179		4,100,557		4,100,472		4,100,231	22 :	4,100,188
	4,099,813		4,100,301		4,100,579	16 :	4,099,595		4,100,235	24 :	4,099,319
	4,099,818		4,100,312		4,100,581		4,099,596		4,100,236		4,099,361
	4,099,824		4,100,347		4,100,604		4,100,042		4,100,258		4,099,591
	4,099,852		4,100,381		4,100,608	17 :	Re.29,701		4,100,268		4,099,920
	4,099,876		4,100,412	08 :	4,099,401		4,099,320		4,100,358		4,099,957
	4,099,931		4,100,426		4,099,567		4,099,321		4,100,359		4,099,967
	4,099,946		4,100,445		4,100,605		4,099,322		4,100,368		4,100,102
	4,099,956	01 :	4,100,610	09 :	Re.29,696		4,099,324		4,100,380		4,100,160
	4,099,979	04 :	4,099,489		4,099,281		4,099,330		4,100,444		4,100,161

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30 : 4,099,578
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4,099,936
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